

Working Papers

URBAN ENVIRONMENTAL MANAGEMENT

THE INDIAN EXPERIENCE



**Human Settlement Management Institute (HUDCO), New Delhi,
India**



**Institute for Housing and Urban Development Studies, Rotterdam,
The Netherlands.**

08509

Community Health Cell

Library and Information Centre

367, "Srinivasa Nilaya"
Jakkasandra 1st Main,
1st Block, Koramangala,
BANGALORE - 560 034.

Phone : 553 15 18 / 552 53 72

e-mail : chc@sochara.org

CAPACITY BUILDING FOR THE URBAN ENVIRONMENT

A Comparative Research, Training and Experience Exchange Project

URBAN ENVIRONMENTAL MANAGEMENT

THE INDIAN EXPERIENCE

Edited by

BN Singh

Shipra Maitra

Rajiv Sharma



Human Settlement Management Institute (HUDCO), New Delhi, India.



Institute for Housing and Urban Development Studies, Rotterdam, The Netherlands

Published by
Human Settlement Management Institute (HUDCO)
212, Asian Games Village,
Khelegaon Marg,
New Delhi 110 049

First Printed in May 1996

Printed by:

Akashdeep Printers,
20 Ansari Road
New Delhi-110 002

ABOUT THE PROJECT

The Human Settlement Management Institute (HSMI) of HUDCO, New Delhi in collaboration with Institute of Housing and Urban Development Studies (IHS), Rotterdam initiated in October, 1994 the Government of Netherlands assisted collaborative research project "Capacity Building for the Urban Environment: A Comparative Research, Training and Experience Exchange".

The two main objectives of the project are the development of National Capacity Building Strategies to improve the urban environmental management in India and review and sharing of international experiences.

The focus of the project is on capacity building at the local level. With this end in view, ten examples of "best practices" of urban environmental management were taken up for study and research by various lead research institutions, based on which an outline of National Capacity Building Strategies to improve the urban environment have been formulated and developed under the project for wider dissemination.

DEV-120
08509 1996

CONTENTS

Foreword		Page (v)
Preface		(vii)
Contributors		(ix)
Abbreviations		(xiii)
Glossary of Local Terms		(xv)
1. Power to the People: The Local Government Context <i>Times Research Foundation, Calcutta</i>		1—33
2. Carrying Capacity Based Regional Planning <i>National Institute of Urban Affairs, New Delhi</i>		35—63
3. NGOs/Civic Societies and Urban Environmental Advocacy <i>Development Associates, Lucknow</i>		65—100
4. Integrated Low-Cost Sanitation: Indian Experiences <i>Sulabh International Institute of Technical Research and Training, New Delhi</i>		101—150
5. City-wide "Best Practices" in Solid-Waste Management in Collection, Transportation and Disposal <i>HSMI/WMC of UIFW, New Delhi</i>		151—205
6. Environmental and Health Improvement in Jajmau Area, Kanpur: Lessons and Experiences for Wider Replication <i>Ministry of Environment and Forests, New Delhi</i>		207—234
7. An Approach to Pollution Prevention in Electroplating Sector <i>Development Alternatives, New Delhi</i>		235—254
8. Integrated Study on Wetlands Conservation and Urban Growth: A Case of Calcutta's Wetlands <i>Institute of Wetlands Management and Ecological Design, Calcutta</i>		255—289
9. Sustainable Urban Development: A Case of Navi Mumbai (New Bombay) <i>City & Industrial Development Corporation, Mumbai (Bombay)</i>		291—311
10. Community Based Sanitation and Environmental Improvement Programme: Experiences of Indore, Baroda and Ahmedabad <i>Shri Himanshu Parikh, Ahmedabad</i>		313—336

Foreword

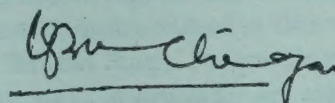
The present volume is a collection of ten working papers based on the report on ten best practices in urban environmental management in India. The case studies help in identifying and prioritising the urban environmental issues and involvement of stakeholders. They also analyse the institutional setting for urban environmental management focussing on key actors, management functions and coordination and decision making in inter-sectoral perspective under a legal and regulatory framework. The studies deal with partnerships-CBOs, NGOs, private sector enterprises, local, state and central governments. Gender concerns of urban environmental management have been given special focus. Lessons and experiences drawn out of the case studied have contributed towards developing capacity building strategies for the urban environmental management.

The volume is the outcome of a collaborative research project between HSMI, New Delhi, and IHS, Rotterdam, culminating into the research studies by lead research institutions on ten identified best practices. HSMI has edited the document for a comparative experience exchange, with similar projects in Peru, Bolivia and Senegal. It is hoped that the document will contribute in sharing knowledge and experience about urban environmental concerns.

This initiative could not have succeeded without the Dutch financial support extended through IHS, Rotterdam. IHS played a pivotal role by collaborating with HSMI in launching of this project and bringing it to this stage.

The current trend in India is to focus on management of urban environment which is a new concern attracting attention due to the prospect of India's entering the next century with more than 300 million urban population. This requires making cities the focus of urban environmental management. But there is a large gap between the responsibilities given to city, municipal and local governments, to provide basic infrastructure and services to the people within their boundaries and the resources, trained personnel and powers available to them to permit them to do so. Without proper institutional capacity building, the local bodies cannot gear up to the formidable tasks assigned to them. The involvement of the stakeholders as well as other citizens also are equally important for developing proper partnerships in the management of urban environment. It is hoped that the contribution made by the researchers will provide valuable inputs in the task of capacity building at the local level.

The project upon which the document is based represents a new phase in the activities of HSMI of HUDCO and research support by IHS, Rotterdam. It is hoped that this document will contribute to the understanding and hence solutions to the problems of urban environmental management besetting our urban areas.



KK Bhatnagar
Chairman & Managing Director, HUDCO

New Delhi
May, 1996

Preface

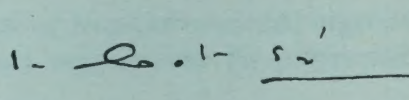
This document, an edited version of Working Papers, provides a general overview of some of the most important urban environmental issues now affecting India. The papers present the outcome of research studies undertaken to document individually main aspects of ten selected cases which have proven successful in the sphere of urban environmental management. The document has been designed to provide a context and perspective providing urban environmental issues which most clearly impinge on the preparation of Local Agenda 21. The analysis presented in the document should be of interest to a much wider audience than those directly involved in the cases studied.

The successful completion of this document is a result of contributions made by many individuals and institutions. First and foremost has been the support extended to us by ten research institutions. The principal researchers were: Shri RM Kapoor, Times Research Foundation, Calcutta; Dr. Dinesh Mehta, National Institute of Urban Affairs, New Delhi; Dr. Yogesh Kumar, Development Associates, Lucknow; Dr. Bindeshwar Pathak, Sulabh International Institute of Technical Research and Training, New Delhi; Shri JC Kala, Ministry of Environment and Forests, New Delhi; Dr. K. Vijaya Lakshmi, Development Alternatives, New Delhi; Dr. PK Saha, Institute of Wetland Management and Ecological Design, Calcutta; Shri GS Gill, City and Industrial Development Corporation, Mumbai and Shri Himanshu Parikh, Ahmedabad. The seriousness with which they completed the studies, the analysis of the case studies they provided characterise the high quality of the results. We are grateful to the principal researchers, their associates and the institutions for their contributions.

We are indebted to the members of Project Advisory Committee (PAC) - Shri KK Bhatnagar, CMD, HUDCO, Shri AP Sinha, Joint Secretary, Ministry of Urban Affairs and Employment, Dr. S Maudgal, Senior Adviser, Ministry of Environment and Forests, Dr. PS Rana, Executive Director (Infrastructure), Dr. Kulwant Singh, Executive Director, HSMI and Shri BN Singh, Project Coordinator-who were kind enough to come together at short notices during the entire project period in providing directions to this Project. Shri KK Bhatnagar, CMD, HUDCO as Chairman of PAC, whose dynamic leadership, close monitoring and able guidance made the completion of the tasks within stipulated time frame. Dr. Florian Steinberg, Project Leader, Indian Human Settlement Programme was also involved with the research study process and made significant contribution in going through the draft and making valuable suggestions for its finalisation. Our appreciation goes to the participants of Expert Group Meetings and National Forum, the Discussants and the Experts, without whose willing contributions and inputs, the document could not have been completed.

We also thank all organisations related to this project for extending all possible support and facilities for carrying out research studies. The secretarial assistance of T Balaji and Mohinder Singh cannot be under-valued in this whole exercise. Finally, the contributions and sustained efforts made by the project team comprising Shri BN Singh, Project Coordinator, Dr. Shipra Maitra, Research Coordinator and Shri Rajiv Sharma, Project Associate and Training Co-ordinator are acknowledged in bringing this document to this shape.

New Delhi
May, 1996


Dr. Kulwant Singh
Executive Director, HSMI

Integrated Low Cost Sanitation : Indian Experiences

Sulabh International Institute of Technical Research and Training, New Delhi.

INTRODUCTION

Mahatma Gandhi initiated a mass movement for removal of untouchability and for upliftment of scheduled and backward caste communities, especially the scavengers at Godhra town, Gujarat in 1917. When India attained independence, provision for upliftment of the status of these communities was made in the Indian Constitution. Even then no worthwhile special schemes were taken up by any state in any substantial manner till the early eighties; only small provisions available under Backward class sector were utilized. Among the scheduled castes, scavengers were treated as untouchables as they carried human excreta manually after cleaning dry latrines and drains, as part of their traditional occupation. During the Fifth Five Year Plan period some schemes were formulated for scavengers but these did not have long term perspective. After setting up various commissions and committees for scavengers from 1949 onwards it was at the beginning of the Sixth Five Year Plan, a separate Centrally Sponsored Scheme of liberation of scavengers was introduced by the Ministry of Home Affairs, Government of India under the Protection of Civil Rights Act, 1955. This led to the conversion of dry latrines into pour-flush latrines and construction of new pour flush toilets with a view to promoting the scheme of liberation of scavengers and their dependents from their degrading occupation. The dedicated role played by Sulabh International Social Service Organisation (SISSO) for promotion of both the programmes during the decades of seventies and eighties are not only noteworthy but laudable. There are two NGOs, namely, Safai Vidyalaya and Gandhi Smarak Nidhi who have also contributed to the success of the programme, although their area of operation is limited to Gujarat and Maharashtra, whereas the scale of operation of Sulabh is not only throughout different States in India but also beyond national frontiers. The implementation of both the programmes, however, was taken up in a massive way by the Ministry of Welfare, Government of India. Subsequently, it was felt desirable to have co-ordinated approach, and thus Integrated Low Cost Sanitation and Scavengers Liberation Programmes were brought together from 1989-90 onwards under the Ministry of Urban Development (now named as Ministry of Urban Affairs and Employment) as the nodal agency for implementation of low cost sanitation programme and the Ministry of Welfare for liberation and rehabilitation of scavengers and their dependents. The financial pattern for the programme was also modified.

The broad objective of this study is to highlight important examples of urban environment management experiences of 'best practices' followed by the Sulabh International Social Service Organisation (SISSO) and other NGOs/voluntary organisations at micro levels, with people's participation, in implementation of integrated low cost sanitation-cum-scavengers liberation programme in different geo-physical and socio-economic conditions.

OBJECTIVES OF THE STUDY

- a) to study the status of scavengers, liberation, rehabilitation and training programme;
- b) to explain the need for an appropriate low-cost sanitation technology;
- c) to study socio-economic, techno-economic and socio-cultural aspects;
- d) to study gender issues : nature and extent of women's participation;
- e) to spell out the implementation strategies;
- f) to assess community involvement in adoption of low-cost sanitation technology;
- g) to identify potential for applicability to different situations and sustainability and replicability;
- h) to assess the role of Non-Governmental organisations (NGOs)/voluntary organisations for programme implementation;
- i) the role of government including local bodies as provider and facilitator; and
- j) to assess 'Capacity Building strategies' of local bodies for promotion of integrated low cost sanitation-cum-scavengers liberation programme.

THE EXPERIENCE

BASELINE SITUATION : AN OVERVIEW

The word environment has assumed a variety of meanings in today's development scenario. It would perhaps be appropriate

DEX-120
08509 N96

that one modestly clarifies what one is trying to assess in this study on integrated low-cost sanitation vis-a-vis capacity building for the urban environment. On the whole, the main components that would make a satisfactory sanitary urban environment would include latrines, sewerage, wastes disposal, drinking water systems and hygiene at household level. These essentials will have to be evaluated in terms of the reality that the dominant group that is served by low-cost sanitation in respect of twin pit pour flush (PF) latrines lives in slums or almost slum-like conditions. Further, the community toilet complexes with bathing, washing and urinal facilities also cater, especially in metropolises, to the needs of floating population represented by commuters. "Research", it has been well said, "nearly always raises more questions than it answers" (Social Change, March 92 Vol. 22 No. 1 Prodipto Roy et.al. Measuring Bustee Environment in Calcutta). The present study poses an important issue, namely, whether low-cost sanitation (LCS) programme would receive adequate attention in the present economic reform measures initiated by the Government of India, for the social cost involved is rather high. Unless this aspect is resolved in the interests of deprived sections of the country's population, the capacity building measures for upgrading urban environment will be seriously hampered.

It has been brought out in many studies eloquently that dry or bucket latrines constitute a threat to health and hygiene through neighbourhood environment pollution. Low cost sanitation

measures of a composite nature demonstrated by certain experiments by Sulabh International in Patna with functional and appropriate marketing and delivery system amply support the view that LCS is an answer to degrading urban environment.

The positive role of urbanisation is often over-shadowed by the evident deterioration in the physical environment and quality of life in the urban areas caused by "widening gap between demand and supply of essential services and infrastructure", laments the Eighth Five Year Plan document of the Planning Commission, Government of India. It has been officially admitted that the gap between demand and supply of infrastructural services has been continuously widening. The worst sufferers are the poor, whose access to basic services like drinking water, sanitation, education and health services is shrinking. The 1992-97 Eighth Five Year Plan document notes that "unabated growth of urban population has made the problems of urban housing more severe resulting in proliferation of slums and squatter settlements and decay of city environment". The two important schemes in operation to combat the problems are the Urban Basic Services Scheme (UBSS) and Environmental Improvement of Urban Slums (EIUS) in addition to Low Cost Sanitation Programme.

The physical achievement envisaged at the end of the Eighth Plan (1992-97) has been projected in the Plan document as :

Item	Envisaged coverage as on 31.3.92		Expected coverage during Eighth Plan	Expected cumulative coverage at the end of the Eighth Plan	
	Population (In million)	Percentage	Population (In million)	Population (In million)	Percentage
Urban Water Supply	185.67	84.90	65.00	250.67	94.03
Urban Sanitation	104.76	47.90	80.00	184.76	69.31

Note : Percentage is with respect to total projected urban population

Source : Table 13, p. 384, Eighth Five Year Plan, Planning Commission, Government of India.

In earlier chapter paragraph continued below table.

An official report of HUDCO as of May 1995 provides details of LCS schemes sanctioned in different states covering 996 towns. It has been indicated that a total of 23.931 lakh¹ PF latrines have been approved through conversion of 13,58,747 dry latrines to PF toilets and construction of 10,34,155 new ones. It is reported that due to various problems in implementation physical achievements are not upto expectation. It is also indicated that (as at the end of May 1995) 84,932 scavengers are expected to be liberated enabling them to seek alternative dignified occupations.

¹ 10 lakh = One million

NATIONAL SCHEME OF SCAVENGERS LIBERATION AND REHABILITATION

The National Scheme of Scavengers Liberation and Rehabilitation was formulated by the Ministry of Welfare, government of India in 1991-92. The scheme has the following components:

- Time bound programme for identification of scavengers and their dependents and their aptitude for alternative trade through a survey.
- Training in identified trades for scavengers and their dependents at the nearest local training institutions/

centres of various departments of State and Central Government and non-government organisations.

- c) Rehabilitation of scavengers by providing subsidy, margin money loan and bank loan.

It is stated that under the National Scheme, the responsibility for rehabilitation of municipal scavengers in the service of local bodies is that of local bodies themselves. The scheme provides training to private scavengers and dependents of scavengers, community as a whole. In this context, an All-India survey was conducted by the Ministry of Welfare, Government of India to identify scavengers and their dependents. The state governments got the survey conducted to identify number of scavengers and their dependents for their training and rehabilitation. Statewise breakup of the stage of survey, number of scavengers identified, target for training and rehabilitation as well as release of funds by the Ministry of Welfare, Government of India from 1991-92 to 1994-95 was carried out in 20 states. It indicates that the survey is yet to be completed in Bihar, Gujarat, Karnataka, Uttar Pradesh and Nagaland. Till the beginning of 1994-95, about 7.20 lakhs scavengers have been identified in 20 States. The Ministry of Welfare, Government of India released Rs. 60.73 crore for training and rehabilitation of 15,578 beneficiaries in 1992-93. In 1993-94, Rs. 70.993 crore and in 1994-95, Rs. 13.80 crore have been released for training and rehabilitation of scavengers and their dependents.

The National Scheme has laid down a funding pattern for financial assistance for Self Employment. For example, for a project costing Rs. 50,000, the break-up would be Rs. 10,000 subsidy, Rs. 7,500 margin money loan from the State Scheduled Castes Development Corporation and Rs. 32,500 loan from the banks. It is estimated by the Ministry of Welfare, Government of India that average expenditure for providing training to each identified child/dependent might not be more than Rs. 500 which includes stipend of Rs. 150 per month. It is further stated that identified children/dependents of scavengers would be provided training in identified trades for one month to six months only. The entire expenditure for training would be borne by the Ministry of Welfare, Government of India.

SEWERAGE SYSTEM

In majority of the towns and cities in India, there exist more than 54 lakh insanitary latrines (commonly known as dry or bucket latrines).² These require the services of scavengers to maintain sanitation. This, they achieve by manually removing excreta and carrying it for disposal to far-off sites. There are also many households in towns/cities of the country which have no access to latrines at all and consequently they are compelled to defecate in open spaces thereby causing unhygienic environment, contributing to many water borne diseases like cholera,

typhoid, jaundice, polio, diarrhoea, dysentery, etc. In addition, to performing degrading jobs, scavengers are poor and socially suppressed. Further, the scavengers subject themselves to many serious health hazards. In brief, dry latrines cause immense damage to social fabric, environmental desirables and health standards.

Base-cum-Issues Paper of Ministry of Urban Affairs and Employment, Government of India (August 1994) for Habitat II United Nations Conference on Human Settlements describes the sanitation status in the country as under:

"The data on accessibility of the entire urban population to sewerage system are not available. However, according to estimate of the Planning Commission, hardly 20 per cent of urban population have access to flush arrangement connected to sewerage system, 14 per cent have access to water borne toilets connected to septic tanks, 33 per cent have bucket or dry latrines and the remaining 33 per cent do not have access to any facility whatsoever."

The analysis of accessibility to sewerage system according to income level indicates that the beneficiaries happen to be only the upper income groups. Urban poor and the low income group people hardly have accessibility to sewerage system. To quote from the report of the National Commission on Urbanisation (NCU). "If the water supply system is unequal and unjust being highly biased in favour of the rich, the sewerage system is even more unjust and even more highly biased in favour of the rich" (NCU Report 1988).

DRAINAGE SYSTEM

The analysis of drainage system also does not present a happy situation. The NIUA study reveals that out of 127 towns and cities which responded to the questionnaire of the study, the drainage system covered only about 66 per cent of urban population. Thus, a little more than one-third of urban population in the sample towns and cities are not serviced by drainage system (NIUA, 1989). In about one third of the urban centres more than 40 per cent of urban population was not being served by drainage system.

GARBAGE DISPOSAL

In India, on an average, the amount of solid waste generated varies from 300 to 500 grams per person per day and the density varies from 100 kg. per cu.m. to 600 kg. per cu.m. At this rate, the amount of solid waste generated in the towns and cities is tremendous. As against this, the management of solid waste disposal seems to be far from satisfactory. The situation is grim especially in the small and medium towns where there does not exist any rudiment of hygienic disposal system. The

² Report of the Task Force for tackling the problems of scavengers and suggesting measures to abolish scavenging with particular emphasis on their rehabilitation - Planning Commission, Government of India (1990-91)

NIUA study reveals that in the 153 sample towns, 27.5 per cent of the total waste generated remained uncollected and scattered on the streets (NIUA 1989). It further reveals that of the 153 responding towns and cities, 41 per cent had a refuse disposal level below the sample average of 72.5 per cent. In 12 urban centres, the level of uncollected waste was 50 per cent or even more".

It is generally felt that "at the planning level there is lack of understanding of what sanitation means as well as poor coordination". More specially, the Ministry of Urban Development, the main actor to achieve satisfactory level of sanitation in urban areas and the crucial agency to catalyse "capacity building for the urban environment" looks at the issue in narrow perspectives like sanitary latrines; the Ministry of Welfare in terms of only of rehabilitation of scavengers; the Ministry of Health looks into the health related problems of sanitation only and the Ministry of Non-Conventional Energy Sources considers using garbage for energy augmentation. The, more or less, parallel set-up in the State Governments does not view the issue of sanitation any differently. In between, some NGOs do their bit in their own way to tackle sanitation problems. What is lacking is responsible coordination and monitoring attuned to achieve results.

AN ACTION PLAN : INTEGRATED LOW COST SANITATION FOR LIBERATION OF SCAVENGERS SCHEME

Low Cost Sanitation facilities had been provided since the plan era through different schemes operated by different agencies like Ministry of Welfare (MOW), Ministry of Urban Development (MOUD),³ Housing & Urban Development Corporation (HUDCO), Ganga Action Plan, State Governments and local body agencies. Largely, these schemes have now been integrated into one scheme namely the 'Integrated Low Cost Sanitation for Liberation of Scavengers' as a part of the Action Plan of the Government of India, for elimination of manual scavenging by the end of Eighth Five Year Plan period. This scheme was introduced during the financial year 1988-89.

AIM OF THE PROGRAMME

The prime objective of the integrated programme is to completely eliminate manual scavenging practice due to usage of dry latrines or open defecation. A whole town approach is being followed by (a) conversion of the existing dry latrines into low cost pour flush twin pit latrines, (b) construction of new pour flush latrines, (c) providing community latrine facilities for those households where the provision of sanitation units is not possible due to space constraints or difficult soils, water table conditions or any other reasons.

FINANCIAL ASPECTS

The programme is financed by the Government of India, for

conversion/ construction of latrines upto plinth level, with a subsidy component from MOUD and with supplementary loan component from HUDCO.

The subsidy and loan rates are based on the beneficiary's income level. Subsidies are provided to Economically Weaker Sections (EWS) and Lower Income Group (LIG) only. For construction upto plinth HUDCO loan is available, the range varying from 50% for EWS category to 75% for HIG Category under normal housing norms. For community latrines, 90% of the cost is made available by HUDCO as loan to local bodies and the balance is met by the local bodies/State Governments. As the cost of construction of superstructure is not covered under the Integrated Low Cost Sanitation Programme, HUDCO has extended its normal programme of financing to cover this component as per the financing pattern for construction of houses for various categories.

ROLE OF NGOS IN IMPLEMENTATION OF THE PROGRAMME

- (a) NGOs play a vital role in implementation of Low Cost Sanitation-cum-Scavengers Liberation Programme involving identification of beneficiaries, motivation of the community to come forward for conversion of dry latrines/construction of new latrines, collection of beneficiaries, contribution and also educating the people to have a clean and hygienic environment and use of pour flush latrines apart from organising labour and materials for implementation of the programme.
- (b) Various methods are adopted for creating awareness among the community about the programme namely, motivation through house-to-house approach, printing of posters, pamphlets, cinema slides, drum beating, newspapers, etc. NGOs also print all necessary forms including agreement forms, etc.
- (c) The local bodies lay down the guidelines for execution of work, procurement of materials under the supervision of their officials, and thereafter release funds (subsidy and loan component) to the NGOs for implementation. The total amount of interest and principal payable by beneficiaries are worked out for recovery from beneficiaries along with property tax, in appropriate manner regularly by local bodies.

Periodical progress report is prepared by the NGOs and monitored by the local bodies for higher level formulations for mid-way corrections, if any, to achieve targets.

- (d) The scavengers liberated on completion of the scheme are invariably absorbed in the respective municipalities/local bodies as street sweepers, drain cleaners, gardeners, etc. For changing the designation of the scavengers, the local bodies take appropriate action to

³ Now named as Ministry of Urban Affairs and Employment

obtain approval of the competent authorities. The children/dependents of the scavengers and/or private scavengers are required to be trained/educated for alternate employment opportunities or self-employment and for this NGOs/Voluntary Organisations may be involved to upgrade the social status of scavengers. There are three important non-governmental organisations, apart from localised smaller ones, which have contributed reasonably well in implementing low-cost sanitation-cum-scavengers liberation programmes. They are (1) Sulabh International Social Service Organisation, Patna, Bihar (2) Safai Vidyalaya, Ahmedabad, Gujarat and (3) Gandhi Smarak Nidhi, Pune, Maharashtra.

Sulabh International Social Service Organisation (SISSO) as an NGO has brought about a revolutionary change in the movement of liberation, training and rehabilitation of scavengers and their dependents by implementation of low cost sanitation scheme through technological innovations. The scale of operation originating from Patna (Bihar) spread over not only in different states and union territories but also beyond the national frontiers. Whereas, the other important NGOs, namely, Safai Vidyalaya and Gandhi Smarak Nidhi restricted their area of operation to Gujarat and Maharashtra respectively. Sulabh has implemented the scheme of Low Cost Sanitation by conversion/construction of 730430 pour flush latrines and constructing 2879 community complexes, which are being operated and maintained by them on "pay and use" basis. In other words, about 10 million people every day (6 million from PF latrine and 4 million from community toilet complexes) are being benefited by using the services and facilities provided by Sulabh International in India. It is reported that by conversion of drylatrines and construction of community complexes as many as 37,000 scavengers have been relieved of scavenging work; 240 towns have been declared as scavenging free; 61 human excreta based bio-gas plants have been installed; and 3406 liberated children/dependents of scavengers have been trained in Sulabh Institutes at Delhi and Jambhul (Maharashtra) as well 312 children of scavengers are getting training in Sulabh Public School in Delhi and 96 in the Technical Training Centre in the main campus of Sulabh International, Delhi

METHODOLOGY OF THE RESEARCH

The implementation of low cost sanitation scheme is being carried out by various non-government organisations (NGOs), local bodies and contractors. Among the NGOs, the scale of operation of the Sulabh International Social Service Organisation (SISSO) is spread throughout the country, while those of other NGOs/voluntary organisations have been limited and localised in only a few towns. Sulabh has implemented the

scheme of conversion/construction of PF latrines in households and is maintaining community toilet complexes in eighteen states and two union territories. So far, it has covered 1179 towns in these states and union territories.

SELECTION OF TOWNS/CITIES

It was decided that 50 percent of the states would be covered for household survey of individual household PF latrines and beneficiaries of community complexes. Accordingly, ten states were selected originally covering all the major zones of India - North, South, East, West and Central. From each state one town was then selected on purposive sampling basis.

The criteria chosen for selection of ten towns/cities were size of population, geographic distribution, size of sanitation aspects covered, physical and socio-cultural characteristics of the areas, etc. It was decided that selection of the towns should be such as might represent very large metropolitan cities as well as relatively smaller and medium size towns. Thus four metropolitan cities, namely, Hyderabad, Bangalore, Bombay and Madras having more than 25 lakh population, medium towns of Patna and Bhopal having 10 lakh population and four relatively smaller towns, Mirzapur, Ajmer, Puri and Jammu having less than 5 lakh population were selected. These towns/cities have heterogeneous character, differing not only in physical characteristics but also in socio-cultural characteristics. They belong to different linguistic, social and cultural regions. So far as physical characteristics of the towns/cities, they range from alluvial to sandy and rocky.

It was also decided that the selected towns/cities should be such as to cover both large and small scale sanitation measures. Therefore towns, namely, Jammu, Puri, Ajmer and Mirzapur with less than 20 community toilet complexes; five towns namely, Hyderabad, Patna, Bangalore, Madras and Bhopal with 20 to 39 complexes and Bombay with a large number of complexes (201) operated by Sulabh were selected. The main reason for selection of Bombay was to understand the various facets of management of city having a large number of community complexes catering to the needs of commuters, besides local beneficiaries.

SAMPLING PROCEDURE : HOUSEHOLD TOILETS

The sample size of beneficiaries of household toilets has been worked out on the basis of percentage of total number of household toilets converted/ constructed by the NGO in each selected town. It was decided that one and a half percent of sample beneficiaries will be interviewed with a minimum number of 100 in each town. In case the number of beneficiaries is less than 100 in any town, all beneficiaries will be interviewed. All these beneficiaries have been selected from east, west, north, south and central areas of each town.

The total number of beneficiaries in ten towns (excluding Bombay and Bangalore where household toilets have not been

converted/constructed by Sulabh) works out to 1196 only. But in some towns, the number of sample beneficiaries exceeded the required sample size. Thus, the total number marginally increased and 1208 beneficiaries have been interviewed against the target of 1196 beneficiaries (Refer Table 4.1).

SAMPLING PROCEDURE : COMMUNITY TOILET COMPLEXES

Selection of sample beneficiaries of community complexes have been done on the basis of purposive sampling. It was decided that the selection of community complexes in each town will be done on the basis of maximum number of visitors to the complex. Beneficiaries of community complexes were interviewed in these complexes from morning till evening. It was also decided that from each community complex at least 25 beneficiaries would be selected. Eighteen community complexes, out of a total number of 408, have been selected in ten towns, where the maximum number of people avail of toilet-cum-bath facilities. Out of 18, six community complexes have been selected from Bombay city alone, where large number of local people and commuters are availing of the facilities every day. Thus, the total sample of 468 beneficiaries have been interviewed as against the sample size target of 450 beneficiaries (Refer Table 4.1).

It may be added that sampling procedure adopted for additional five towns was the same, as for the ten towns studied earlier.

Thus for the second phase five towns, the total sample size for household toilet beneficiaries was 446 against which 441 schedules were administered. One community complex was selected in each of these five towns and from each complex 25 beneficiaries were selected. The total sample size for community complex beneficiaries was thus 125 and all were administered. The name of the towns selected, the name of the organisations involved in low cost sanitation scheme and the sample size are given in Table 4.1.

IMPACT AREAS AND ASSESSMENT : CASE STUDY OF SELECTED TOWNS

This section attempts to highlight briefly the geo-physical status, demographic characteristics, slum population, household toilets and community toilet complexes constructed by Sulabh and other NGOs, the survey findings, as well as assess the gap in toilet facilities in fourteen selected towns (Refer Tables 4.2 to 4.7).

1. HYDERABAD (ANDHRA PRADESH)

The city of Hyderabad is located near 17 degree north latitude and 78 degree east longitude and is spread over an area of 269 sq. km. Elevated by about 536 metres above sea level, its soil is sandy and granite. It receives an average rainfall of 880 mm in a year. Potable water is available at a depth of 30 metres. Water level in summer/winter varies between 15 and 40 me-

tres. The city has a population of about 30 lakhs out of which about nine lakh people are residing in the slums which cover about 3.63 sq. km of area.

Before the introduction of LCS Programme in the city, there were about 3.5 lakh households, of which about 27% numbering 94395 did not have latrines in their houses. About 27% of the houses have sewer connection and about 46% are covered with septic tank or other water flush latrines.

Under the LCS Programme Sulabh started its operation in the city in 1986 and by the year 1990, it constructed 7402 household latrines and all of them are currently used. Later on other NGOs, namely, Urban Poor Society, Weaker Section Society and Urban Poor Syndicate have constructed/converted about 7300 PF latrines.

About 1873 scavengers were identified in the city of Hyderabad, 227 of them had received training in different trades. In all 466 scavengers had been liberated till August 1995.

There are 26 community toilet complexes located in different areas of Hyderabad city which were constructed and are being maintained by Sulabh. These complexes were constructed between 1986 and 1995. All of them have toilet facilities for both males and females though the number of toilets for males is more than those for females. There are altogether 165 units of toilet for males as against 70 for females. As for bathing facilities, there are 79 units for males as against 26 units for females, while there are 81 urinal facilities in 16 complexes for males as against two for females. The average number of daily users per complex works out to 1046 with a minimum of 200 and a maximum of 2500. The number of disabled persons and children visiting these complexes account for about 15 percent and 14 percent respectively. At each complex 4 to 6 social workers (caretakers and attendants), depending upon the size of the complex are deputed for the maintenance of the complex. They also collect service charge from the users. Only one complex located at Secunderabad Railway Station is being maintained by another NGO, the Lions Club. Apart from these, about 349 public toilets are being maintained by the Municipal Corporation.

About 1500 metric tons of solid waste is generated in the city everyday, of which only 1000 tons are sent to two land filling sites. Since only two thirds of the solid waste is cleared by the Municipal Corporation, about 500 tons are left unmanaged and cause nuisance, insanitation and environmental degradation in the city. About 522 million litres a day of waste water is being generated in the city of which only 140 million litres a day are collected for treatment and the rest flows through surface drains causing water pollution.

2. PATNA (BIHAR)

Patna stands on the bank of the river Ganga, covering an area of about 109.22 sq.km. Its elevation above mean sea level is 53 metres and soil is alluvial. Good quality underground water

is available. The water table varies between 5 to 7 metres only. The water level settles between 5 to 12 metres. The city receives an average annual rainfall of 1154 mm. The city had a population of about 9 lakhs in 1991 and about 35% of them are slum dwellers. About eight per cent of the total area of the city is occupied by slums.

Prior to introduction of LCS Programme in the city, there were about 76000 households and about 22000 of them did not have any latrines in their houses. About 10,000 septic tank latrines were there and about 6000 households were covered by sewers.

During the period 1985-86 to 1987-88, a total number of 1465 scavengers (males 1266 and females 199) which include their dependents were liberated and imparted training in nine different trades (short hand, typing, carpentry, electrician, mechanic, leather goods, tailoring, cane-work and mason). There were about 900 scavengers working with the Corporation and all of them have been absorbed in the Corporation.

Sulabh started constructing household toilets in Patna in the year 1974 and upto the year 1987-88, 18235 households were covered. All the latrines are currently being used. No other organisation is active in providing PF latrines in the city.

There are 39 Sulabh operated community toilet complexes located in different areas under Patna Municipal Corporation. These community complexes were constructed between 1977 and 1984. The majority of complexes were constructed before 1980. As many as 24800 people are visiting these 39 complexes per day, of which 8272 (33.4 per cent) are women, 1575 (6.4 per cent) are children, 4745 (19.1 per cent) are disabled persons and 10208 (41.1 per cent) are adult males. All the complexes have toilet facilities; 510 units for males as against 73 units for females. Twenty complexes have 55 units of bathing facilities for males as against six for females with 18 bathing units. Twenty five complexes have 63 units for urinal facilities for males as against two complexes for females with seven units. The number of visitors to these complexes varies from 50 to 4000 per day. Comparatively, more people are availing of the facilities of community complexes located at Patna Railway Station, Patna Bus Stand and Gandhi Maidan.

Akhil Bhartiya Paryavaran and Gramin Vikas Sansthan, an NGO, has also constructed 39 community toilet complexes in the city.

Besides these, there are nearly 135 community complexes constructed and operated by the Municipal Corporation. All of them have been in a very dilapidated condition since long.

Management of solid waste in the city is the responsibility of the Corporation. The performance of the Corporation in regard to solid waste management is not satisfactory. About 1000 tons of garbage is generated in the city every day but only 300 tons is cleared. Participation of the local people in this activity is almost negligible.

At present Patna has two functional effluent treatment plants, where a part of the waste water of the city is managed properly. But in many parts of the city there is no proper system of waste water management. Moreover, the low lying areas of the city get flooded during the monsoon and create environmental pollution. Out of 141 million litres of generated sewage only 83.2 million litres per day are cleared. The 3 lakh cattle population mixes freely with the 10 lakh plus humans creating very difficult sanitary problems.

3. JAMMU (JAMMU AND KASHMIR)

Located near the 33rd north parallel and 75 degree east longitude and on the foothills of the Himalayas, Jammu is elevated by 450 metres above mean sea level and is spread over an area of 40 sq.km. Its thin layer of alluvial soil covers boulder conglomerate mixed with hard clay. Groundwater is available at a depth of six metres. The average annual rainfall in the city is about 1348 mm. Census was not conducted in Jammu and Kashmir in 1991. According to 1981 Census, the city had a population of about 2 lakh. Only three per cent of the people of the city reside in the slums which comprise 1.5 sq.km. area, which is about 3.75% of the total city area.

Prior to introduction of LCS in the city there were 35771 households of which 8700 houses had septic tank latrines, 17500 had dry or bucket latrines and 9571 houses had no latrines at all.

There were about 1054 scavengers in the city before the LCS programme started. Out of these 371 (146 males; 225 females) have been trained. Males were imparted training in computer courses and females in cutting and dress designing.

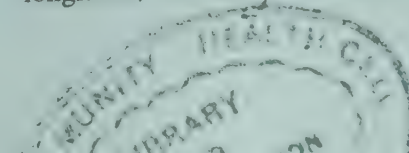
Sulabh started constructing household toilets in the city in the year 1984-85 and by the year 1990-91, 9258 households were covered. All the households are currently using the toilets.

There are eight Sulabh operated community toilet complexes in Jammu. Five of them were constructed during the last three to four years. All the eight complexes have toilet facilities for females. There are 53 units for toilet facilities for males as against 15 for females. As for bathing facilities, six complexes, having 21 units are for males as against two complexes with two units each for females. As for urinals, six complexes with 18 units are for males. The number of visitors to these eight complexes per day is 2372. The number of users for individual complex varies between 12 and 750. The disabled and children constitute a very small proportion of users - just a little over three per cent. The number of social workers attending a complex varies between two to five.

Solid waste in the city is collected and disposed of by the municipality and waste water is disposed of through open drains.

4. BANGALORE (KARNATAKA)

The city is located near the 13th parallel and the 78th east longitude, with an area of 225 sq.km. The elevation of the city



is 900 meters above mean sea level. The soil is a series of black cotton, red loam rocky gravel. It receives an annual average rainfall of 780 mm. The ground water levels are seven to eight metres and five to six metres during summer and winter, respectively. Water available here is potable but hard. According to the 1991 Census the city had a population of 26.6 lakh. About 13% of the city population is living in the slums, which occupy 6.7% of the city area.

In Bangalore, 2501 scavengers were identified of which 1307 were males and 1134 females. Among the liberated scavengers, 1367 (840 males and 527 females) are engaged in self employment and 421 are employed in different organisations.

There are 38 Sulabh operated community toilet complexes in different areas of Bangalore. These were constructed between 1982 and 1995. All the complexes have toilet facilities for males as well as for females. The number of units of toilet facilities for males in these complexes is 364 as against 217 for females. Out of the 38 complexes 37 complexes have 163 units of bathing facilities for males and 102 for females, 29 complexes have 183 units of urinals for males as against two complexes having one urinal facility each for females. The total number of persons visiting these complexes a day is around 27320. The users of individual complex per day varies between 5 to 3500. The average number of visitors works out to 719 per complex. The number of disabled persons visiting these complexes is two percent. Children also constitute two percent of users.

The number of social workers attending the complexes varies between one to eight on each for day to day maintenance as well as collection of service charges.

Nearly 63% area of the city has sewerage facilities and nearly 2130 tons of solid waste is generated. The responsibility for its collection and disposal is vested with the Municipal Corporation. But only 1800 tons of garbage is cleared by the Corporation. Out of 275 million litres of sewage generated in the city only 250 million litres are cleared. It is one of India's cleaner cities but with fast expansion of the city and migrants pouring in, it is becoming difficult for the Corporation to cope with the demand for services.

5. BHOPAL (MADHYA PRADESH)

The city is located near the intersection of 23rd north latitude and the 77th east longitude. It lies on the edge of Malwa Plateau and is elevated from mean sea level by about 460 metres. The city is spread over an area of 284.9 sq.km. Soil comprises a series of red stone, black trap and murrum, clay silt, lime stone and black cotton soil. Average rainfall over the city is about 1260 mm. The ground water level varies between three to eight metres. In 1991, the city had a population of 10.6 lakhs and about 23% of them live in the slums. The slums occupy 1.17 percent area of the city.

Before the LCS Programme started in the city in 1987, there were about 2.5 lakhs households. No data of the status of latrines in the town was available. However, rough assessment is that about 50,000 houses had dry/bucket latrines.

There were 17100 scavengers in the city of which 1624 have been rehabilitated. Of them 1811 have been trained in different trades.

Sulabh started constructing household toilets and community toilet complexes in 1986-87. It constructed 21558 household toilets and 38 community toilet complexes between 1987 and 1995. Other NGOs have constructed 14240 household toilets only between 1991 to 1995. There are 229 public toilets in the city, which are being operated and maintained by the Municipal Corporation.

Due to certain constraints, the entire town was not taken up for study. The universe was restricted to concentrated locality of slum area where 605 household toilets and four community toilet complexes exist. These household toilets and community complexes were constructed between 1986 and 1992. All the four complexes have toilet facilities for both males and females. The number of units of toilet facilities for males is 41 as against 34 for females. Similarly, all the complexes have bathing facilities for both males and females. The number of bathing units for males is 22 as against 20 for females. The two complexes have urinals for both males and females. The total number of units for males is nine as against two for females. The number of persons visiting these complexes is a little over 1000 per day with an average 250 visitors per complex. The proportion of disabled persons visiting these complexes is about four per cent and children about 19 percent.

Part of the town has sewerage. Major part of the old town is not covered, almost all the dry/bucket privies exist in this portion of the town. Bath room and kitchen waste water in unsewered areas is disposed of through surface drains. About 500 tons of solid waste is generated in the town. The Corporation has a fleet of vehicles and equipments for its transportation to disposal sites. A mechanical composting plant in collaboration with M.P. Agro Development Corporation has recently been installed, which takes care of 100 tons of solid waste. The remaining is disposed of by sanitary land fill system. The bucket/dry privies are cleaned by the privately employed scavengers. They carry the human excreta to collection depots from where it is transported to the trenching ground by the Municipal Corporation through tankers.

6. BOMBAY (MAHARASHTRA)

Bombay is located at the intersection of the 19th north latitude and 71st east longitude. The city has an area of 437.7 sq.km. The soil is predominantly black cotton. It receives an average annual rainfall of 1902 mm. The water level settles at about 7.6 metres during summer and at about six metres during winter. Water available below the ground is salty and sour. The city

had nearly ten million population in 1991. Forty-five percent of the city population is residing in the congested slums. The slum areas constitute only 45 percent of the city area.

As per the survey conducted by Mahatma Phule Backward Class Development and Finance Corporation, 21,631, Safai Karmacharis have been identified. Out of them 16 males and 10 females have received training in vocational trades such as computers, beauty parlour, photography and motor mechanic. The remaining 21,605 are reported to be employed either in the Municipal Corporation or other organisations.

It is reported that household toilets (PF latrine) have not been constructed in Bombay city at all.

There are as many as 201 community toilet complexes constructed and being maintained by Sulabh. Most of these complexes were constructed during the last five years. All complexes have toilet facilities for men with 1235 units. One hundred and ninety four complexes have toilet facilities for women with 725 units. Out of 201 community complexes, as many as 93 have bathing facilities for men with 148 units, 29 complexes have bathing facilities for women with 36 units. All the complexes have urinal facilities for males with 703 units. The total number of visitors to these complexes is 4.28 lakhs per day with an average of over 2000 per complex. About 3.5 percent visitors are disabled persons, 16 per cent are women. Five to six social workers attend to each complex.

About 5800 tons of garbage are generated in the city everyday but the Municipal Corporation manages to collect only about 5000 tons for landfill and sundry purposes. Out of 1800 million litres of sewage generated a day, 1460 million litres are collected for treatment and the rest is discharged through drains into the Arabian sea.

7. PURI (ORISSA)

A small city on the shores of the Bay of Bengal, Puri has an area of only 16.84 sq.km. The average elevation of the city is about 12 meters above mean sea level. The city's soil is alluvial. It receives, on an average, a rainfall of 1352 mm in a year. Ground water is available at a depth of 9.14 metres. The water level in summer varies between six to twelve metres, while in winter it varies between three to eight metres. Water available here is slightly saline. In 1991, the city had about one lakh of population. More than 30% of the city population is living in slum areas which occupy 4.45% area of the city.

Before introduction of LCS, there were 14193 households in Puri of which 8145 had Dry latrines and 6048 had septic tanks.

In 1987, Sulabh started the work of household toilet construction and a total of 2064 households have been covered till date. No other organisation is engaged for household toilet construction.

Prior to the introduction of LCS Programme, there were 601 scavengers in the town. About 432 of them have been liberated and are working in different organisations. However, no training has been imparted to them.

There are only five Sulabh operated community toilet complexes in Puri town. They were constructed between 1985 and 1990. All the complexes have toilet facilities for both males and females. The number of units for toilet facilities in these five complexes for males is 51 as against 32 for females. All the complexes have bathing facilities for males and females and the number of units are 17 and five respectively. Only in three complexes urinal facilities are available for males while for females all complexes have this facility. The total number of visitors attending these complexes is 1875 with an average of 375 visitors per complex. A little over four per cent of the users are disabled persons and about three per cent are children. In each of these complexes there are four to five social workers attending to day to day maintenance and collection of service charges.

Apart from Sulabh, the Municipality is maintaining three community complexes and the facility can be used free of charge.

8. AJMER (RAJASTHAN)

Ajmer is located near the 26th north parallel and the 75th east longitude, surrounded by the hills around Pushkar in Aravalli range. The geology is that of Aravalli range. It is elevated from the sea level by about 870 metres. The city receives an average rainfall of 494 mm in a year. It has sandy and rocky soil. Ground water level varies between 60 and 90 metres. The area of the city is 241.6 sq.km. and the population as per the 1991 Census was 4.03 lakh. The proportion of slum population in the total population in the city is relatively low i.e. only 1.48 percent. Slums occupy 0.7 percent of the city area.

In Ajmer, there are 67455 households, of which 14179 (21%) households do not have any toilet facility as per 1991 census. As reported, neither the data of different types of latrines (including dry latrines) nor data on scavengers were made available by the concerned authorities prior to commencement of LCS programme.

Sulabh started constructing household latrines in the city in 1989-90 and by 1994-95, 23050 households have been covered.

There are seven Sulabh operated community toilet complexes in Ajmer town. These were constructed between 1988 and 1992. All the complexes have toilet and bathing facilities for both males and females. In these complexes, 80 units of toilet facilities and 34 bathing units for males exist, as against 35 and 22 respectively for females. As for urinals, all the complexes have this facility for males with 24 units as against one complex with two units for females. A total number of 1250 persons visit these complexes per day with an average of 180 persons per complex. The number of social workers per complex is six to eight.

About 200 mld of waste water generated in the city directly flows through surface drains to Anna Sagar channel causing water pollution. There is no sewerage system in the town.

About 250 metric tons of solid wastes are generated in the city every day of which collection and disposal responsibility is of municipality. It is disposed off as land fill at Makhpura near Dattavir, Vadirabad Road. The Municipality has a fleet of vehicles and equipment for its transportation to disposal site.

9. MADRAS (TAMIL NADU)

The fourth largest city in India, Madras is located near the intersection of 13th north latitude and the 80th east longitude and lay by the Bay of Bengal. Elevation rises as the distance from the sea shore increases. The higher elevation is seven metres above the mean sea level. Most of the localities are just at the sea level. The predominant soil is alluvial with scattered patches of gravel. The soil found in coastal areas is alluvial, gravel and sandy. Due to the proximity of the sea, the ground water level is one metre to five metres and water is saline. The city has an area of 571.93 sq.km. and the population was 38.41 lakhs in 1991. About 42 percent people live in slums covering 10.14 percent of total area of the city.

In 1990, Sulabh constructed 28 household latrines in the city. But one of the household latrines has been demolished for reconstruction and in another case the house has been demolished leaving the latrine intact. So, at present, 26 of them are being used.

As reported, survey for identification of scavengers was not carried out in Madras city because the Municipal Corporation took the stand that there were none in the category of scavengers and only sanitary workers were employed in the Corporation for cleaning streets, etc.

There are 86 Sulabh operated community toilet complexes in Madras city. Most of the complexes were constructed between 1990 and 1995. Out of 86 community complexes, 76 have altogether 509 units of toilets for men and remaining 10 complexes have no toilet facilities for men. In 73 community complexes there are 439 units of toilet facilities for women and the remaining 13 complexes have no toilet facilities for them. As for bathing facilities, 72 complexes have bathing facilities for men as well as women. The number of bathing units in these complexes are 132 for men and 122 for women. As for urinals, 22 complexes have 78 units for men and only three complexes with 15 units have urinal facilities for women. The total number of visitors to these complexes is about 56,000 per day with an average of 650 per complex. About nine percent of visitors are children. It is significant that 46 percent of the visitors are women. The number of social workers attending per complex is three to four.

About 2675 tons of garbage is generated in the city everyday

but only 2140 tons are cleared. Out of 250 million litres of sewage generated 238 million litres are collected. But millions of litres flow untreated into three waterways - Covum river, Adyar river and Buckingham canal. These stagnant channels of sewage on the river bank pose a major health hazard, exposing the slum dwellers to filariasis.

10. MIRZAPUR (UTTAR PRADESH)

Mirzapur is a small city situated in conjunction of the Gangetic plain of Uttar Pradesh and the Vindhya range. The soil is predominantly alluvial but silt, sandy loam and kankar are also found. Its elevation from mean sea level is 84.84 metres. Ground water is available at a depth of about 16 metres. Water level during the summer is 16 metres, while during the winter it is about 13 metres. Water is potable. The area of the city is 38.85 sq.km. and the population was 1.69 lakhs in 1991. About 41% of its population reside in slums which constitute about 23.8% of the total town area.

Prior to introduction of LCS, there were 20341 households in the town, of these only 1020 had septic tank latrines. The city had 10170 households with dry latrines while the rest did not have any toilet facility.

Sulabh started constructing household toilets in the city in the year 1988-89 and by the year 1993-94, 2878 of them were constructed. No other NGO was involved.

Before the introduction of LCS, there were 446 Municipal and 70 private scavengers in the town. The LCS in the town, resulted in the liberation of 115 scavengers. No training was given to them. Of the liberated scavengers, 32 are engaged in self employment, 53 are employed by the Municipality, six by Sulabh and the rest are employed by different organisations.

There are 19 Sulabh operated community toilet complexes in Mirzapur town. These complexes were constructed between 1992 and 1995. All these complexes have toilet and bathing facilities for males and females. There are altogether as many as 143 toilet units and 64 bathing units for males as against 138 and 38 respectively for females. Out of 19 complexes, only 17 have urinal facilities for males with two units at each. The total number of people visiting these complexes per day is around 6106 with an average of 321 per complex. Among the users eight per cent are disabled, 22 percent women and 24 percent children. The number of social workers attending the complexes for the maintenance and collection of service charge, varies from one to three per complex depending upon the number of units and users. No other NGO is involved in constructing and maintaining community complexes.

The town does not have sewerage system. Almost the entire town has open road side drains which carry the sullage to eight big covered drains leading to river Ganga. Solid waste is carried by sweepers through buckets or wheel barrows to the collection places from where it is carted outside the town for trenching or dumping in low lying areas for land fill.

11. GOPALGANJ (BIHAR)

A small town, in the gangetic plain of Bihar, Gopalganj has an area of about 11 sq.km. Alluvial formation in the area is about 20 metres. Good quality ground water is available at four to seven metres depth depending on the season. Average rainfall is about 1292 mm. It has a population of about 36000 of which about 6500 live in the slums. The slums are spread over about 1.26 sq. k.m., which is about 11.30% of the total area of the town.

The municipality had about 45 scavengers for servicing the dry latrines before the liberation programme started. About 36 scavengers have been liberated and absorbed in the municipality, but none of them are reported to be trained.

Prior to introduction of the low cost sanitation programme in 1984-85, there were about 4235 households. In about 1683 households, there were dry/bucket latrines, 1021 households were having different types of latrines and 1531 households had no toilet facility at all.

Initially, Sulabh International was nominated to implement the LCS programme and they converted/constructed 935 pour-flush latrines during 1984-86. About three years back, the State Government nominated another NGO known as International Institute of Sulabh System and they have converted/constructed 537 pour-flush latrine during 1992-95. In all 1472 pour flush latrines have been converted/constructed in the town.

There are only two community complexes (one more is under construction). The first is of pay and use type with eight toilets (6 males and 2 females) with one bath room and two urinals for males only. On an average about 300 male adults, 200 female adults and 15 children are using the complex everyday. One of the complexes is being maintained by the International Institute of Sulabh System by engaging six social workers. The second community complex having toilets is being used and maintained by the police force only and has no facility for women.

Collection and disposal of solid waste is an obligatory function of the municipality. This is being done manually and disposed of through tractor/trailor. The system is reported to be far from satisfactory. Lack of finance, labour problems and absence of compatible management system are some of the causes for this state of affairs. The drainage system for disposal of waste is also not satisfactory. During rainy season the low lying areas get flooded and creates environmental hazards, particularly in slum areas. The participation of local people to resolve these problems is negligible.

12. BARWANI (MADHYA PRADESH)

The town is situated on the bank of river Narmada. It has an area of 16 sq. km. The soil is black cotton type. It is elevated from the mean sea level by about 177.5 metres. The average

rainfall is about 507 mm. Soft and good quality ground water is available at a depth of about 15

to 20 metres. As per 1991 census, the town had a population of 33678 with 4862 households. About 8698 people live in slums, spread over about 7.5 sq. k.m. (47%) of the town area.

Prior to LCS programme in 1991-92, out of 4862 households, 267 had water flush toilets connected to septic tanks. One thousand eight hundred and ten households had dry/bucket latrines and the remaining 2785 households did not have toilet facilities.

In 1991-92, eighty scavengers (37 male, 43 female) were identified who were servicing dry latrines. Out of them 56 (24 male, 32 female) have been trained in different trades and rehabilitated.

Initially, Sulabh started implementation of LCS programme and converted/constructed 654 pour flush latrines in 1991-92. Later, the implementation of LCS programme was entrusted to another NGO (Akhil Bhartiya Rachnatmak Karya Sansthan) and it has converted/constructed 755 pour flush latrines during 1992-94. Thus nearly 3200 households are yet to be covered.

There are only two community complexes - one is pay and use type and the other non-pay and use type. Both of them are maintained by the municipality. The former is three seated (2 for male, one for female) and the later is 4 seated (2 each for male and female). No bath rooms have been provided in either of them. However, urinal facility (2 units for male and female each) exists in the latter. About 100 persons use each of the complexes daily. Both are connected to septic tanks. Water is available to the users only during municipal water supply hours as there is no water storage facility.

Solid waste is collected by the municipality and disposed of as sanitary land fill. For disposal of town waste water, there are surface drains discharging in the river Narmada.

13. AMBATTUR (TAMIL NADU)

Ambattur is situated in the Chengalpattu MGR district on the suburbs of Madras city spread over an area of 40.36 sq. km. It is an important industrial centre. Its elevation from mean sea level is five to six metres only. Soil is clay/sandy clay. Average annual rainfall is about 1200 mm. Ground water is available at a depth of two to six metres depending on the locality and season, but its quality is not good, generally saline as it is near the sea. As per 1991 census, it had a population of 215424 of which 138992 (64.52%) were living in slum areas. It is a town of slums only as 84.12% of the total town area covering about 34 sq. km. is occupied by slums.

The LCS programme was introduced in 1991. It is not known as to how many dry latrines existed prior to initiation of LCS programme. But out of 48322 households, 3785 had no toilet

facilities. The conversion/construction of pour flush latrine was entrusted to an NGO (Kalai Selvi Karunalaya) and they converted/constructed 1450 pour flush latrines during 1991-94.

Earlier 51 scavengers (14 males, 37 females) were employed in scavenging by the municipality, who have been absorbed as sanitary sweepers after initiation of scavengers liberation scheme. Training had not been imparted to these scavengers. Information is not available about the number of private scavengers, who are still engaged in scavenging work.

There were 29 community complexes (out of which one has been demolished). These complexes were constructed by contractors engaged by the municipality. It is reported that five community complexes are being used and the rest 23 are not in use. But of these five complexes, two are of pay and use type and the rest three are non-pay and use type. Each of these five has one person for maintenance engaged by the municipality and the remaining 23, which are not in use have no person engaged to maintain.

Generally bullock carts and lorries are used for the clearance of solid waste and surface drains spill over and sillage stagnates here and there, causing insanitary conditions, health hazard and environmental pollution and degradation in a slum town having large number of industrial units.

14. GONDA (UTTAR PRADESH)

The town is located to the north east of Lucknow, near the border of Nepal. Its soil is sandy/clay and elevated by 95 metres from mean sea level. It has an area of 12.67 sq. km. The average annual rainfall here is 1080 mm. Potable ground water is available at a depth of three to six metres. As per 1991 census, the town had a population of 106000 and 26.9% of them were residing in slums. The slums occupy about 35.52% (4.56 sq. km.) of the total area of the town.

Low cost sanitation programme was introduced in 1991-92. At that time, there were 12223 households. About 8882 households had dry latrines, 611 households had septic tank latrines and 2730 had no latrines at all.

The NGOs (Sulabh International and Manav Uthan Samiti) were involved in implementing the LCS programme. A total number of 2390 pour flush latrine have been converted/constructed. There are 10 community complexes in the town and all are pay and use type. These complexes were constructed by Sulabh, Manav Uthan Maha Samiti and private contractors in co-ordination with the municipality. Five complexes are being maintained by Sulabh, three by the municipality and the remaining two by private contractors. One to three social workers are engaged for maintaining these complexes. Toilet and bathing facilities are available in nine complexes for both males and females, but in one complex toilet facility is available, not the bathing facility. There are urinals for males in six complexes and three complexes have urinal facilities for females. Number

of visitors in a complex varies from eight to 418 on an average per day.

Prior to introduction of LCS programme, the municipality had 213 municipal scavengers (128 males, 85 females) and 142 private scavengers (85 males and 57 females). All of them were identified for scavengers liberation and rehabilitation programme. None of them was given training, but all the liberated scavengers have been provided some financial assistance (between Rs. 15000 and Rs. 25000) through bank and SC & ST Finance Corporation to find self employment. Out of 355 identified scavengers, 90 (54 males and 36 females) are engaged in self employment as rickshaw pullers, and band and loud speaker workers during marriage and other functions.

Solid waste is disposed off by the sweepers of the municipality. Water waste of household is discharged in open drains causing acute environmental problems due to extensive water logging.

APPROACHES TO LOW COST SANITATION TECHNOLOGY

Under the present economic conditions, sanitation facilities can not be provided in urban areas in the foreseeable future, if sewerage and septic tank are continued to be advocated because their capital, operation and maintenance costs are too high besides other operational problems. Therefore, an appropriate technological option which provides the most socio-culturally and environmentally acceptable level of service at least economic cost, has to be found.

In India from 1930 onwards, a dynamic search for a safe and economical alternative to the sewerage and septic tank systems for the disposal of night-soil suited to our socio-cultural and economic conditions started. Various low-cost sanitation methods like Khurpi, Trench, Dug-well,

Bore-hole latrines, Over-hung latrine, Drop-privy, Aqua-privy, Off-set Compost latrine, etc. were tried, but failed. They could not satisfy Indian conditions and situations.

The first pour-flush waterseal system with spot disposal of human waste was developed by the All India Institute of Hygiene and Public Health (AIHH&PH), Calcutta in the mid-forties and it was then known as the "dug well latrine". The Research-cum-Action (RCA) Project was later taken up by Govt. of India through the Health Centres of Poonamallee (Tamil Nadu), Singur (West Bengal) and Najafgarh (Delhi) in the mid-fifties. Another project was taken up at Planning, Research-cum-Action Institute (PRAI), Lucknow (U.P.) in 1958 and the off-set double pit system was evolved. These efforts were however restricted to rural areas.

In 1970 it was Sulabh International which first developed and introduced low cost sanitation in urban areas in a big way including towns above 100,000 population. Even the city of Patna with a population of nearly 5 lakh was provided with this innovative system of excreta disposal in congested localities.

Sustainability, replicability and affordability are the three important qualities which should be considered while choosing a technology. Sulabh Shauchalaya (twin pit pourflush toilet) developed by Sulabh International in 1970 fulfils these criteria fully as it is socio-culturally acceptable, affordable, easily available and users are able to operate and maintain it conveniently. It provides all the health benefits by safe disposal of human excreta on-site. Sulabh Shauchalaya is most appropriate to serve as an alternative to bucket privies and prevent open air defecation. It can be constructed even in the most congested areas of cities and towns.

Sulabh Shauchalaya is suitable to communities who use water or soft paper for anal cleansing. In India water is used for ablution except by a very small section of population in the far eastern region and very high altitude areas. Hence Sulabh toilet is highly acceptable, affordable and suits socio-cultural habits and attitudes of the people. Ventilated improved pit latrine can be an alternative for the people who do not use water or thin paper for anal cleansing. The squatting pan and trap of a Sulabh Shauchalaya are of special design requiring two litres of water for flushing. Of the two pits, one pit is used at a time. The liquid infiltrates and gases disperse into the soil through the holes in the pit lining. When one pit is full, the excreta is diverted to the second pit. In about two years, the contents of the pit already filled get digested and become safe for handling. The pit can then be conveniently emptied and is ready to be put back into use, after the second pit is full. Thus the two pits can be used alternatively and continuously. People who do not prefer pour flush, oppose this low cost system. Now two litres flushing cistern has been developed, which can be fixed and the pour flush toilet can be changed to cistern flush whenever desired. Thus it has been possible to overcome one of the factors that led to the non-acceptance of low cost system by the MIG and HIG population.

In a Sulabh Shauchalaya, vent pipe is not necessary as gases get dispersed into the soil. The special feature of this type of toilet is that it has two pits instead of one. The reason being that single leach pit units are appropriate only if they can be de-sludged mechanically by a vacuum tanker, since their contents are not pathogen-free. In the two-pit system, the filled pit can be cleaned manually even by the householder himself because of the long period of digestion which makes it free of foul smell and safe for handling. In a single pit system, de-sludging has to be done immediately after the pit has been filled up to enable its re-use and this involves handling of fresh and undigested excreta which is a health risk. If a deeper and larger single pit is provided, de-sludging operation will be difficult and there would be greater chances of pollution, especially where ground water level is high.

The advantages and specialities of the Sulabh Shauchalaya System are as follows:

- i) It is a permanent installation which is economical and durable. It can be afforded even by the weaker sections of society;

- ii) It is odourless and there is no air pollution, as the waterseal prevents gases from leaking out of the pit through the pan;
- iii) Only a small quantity of water (about two litres) is enough to flush the excreta from the pan into the pit, while conventional flush latrine needs 14 litres of water for flushing. Thus, it conserves water which is a scarce commodity;
- iv) It requires less space than septic-tank latrine. It can be constructed even in the courtyard, corridor, verandah or in the living room of a house, as it is free from foul smell and there is no mosquito, fly or insect nuisance;
- v) It can be constructed in cross socio-cultural and economic set-ups where water is used for ablution, and in varied physical, geological and hydrogeological conditions with proper precautions;
- vi) The technique of construction of the Sulabh Shauchalaya is simple enough; an ordinarily trained mason can easily build it. It can be constructed by using local labour and materials;
- vii) It can be constructed on the upper floors of buildings also;
- viii) As the pits are covered with air-tight and water tight R.C.C. slabs, the place can be utilised for other purposes too;
- ix) It is free from all health hazards and does not pollute surface or ground water or drinking water sources like hand pumps, wells etc. if proper precautions are taken at the time of construction;
- x) Maintenance is easy, simple and costs little;
- xi) Services of a scavenger are not needed to clean the pit. The house owner himself or any labourer can clean it because the sludge of the pit is safe for handling after two years of rest period;
- xii) Organic manure and soil conditioner of good quality become available to the householder for use in the field or garden;
- xiii) It has a high potential of upgradation. The Sulabh Shauchalaya can be connected easily to sewers when sewerage is introduced in the area; and
- xiv) A low volume flushing cistern can be attached to avoid pour-flushing.

COST EFFECTIVE

Sulabh Shauchalaya is cost effective. It can be designed with different specifications and use of different types of material without compromising the basic design principles with variable costs ranging from Rs. 500 (US \$ 15) to Rs. 5000 (US \$ 150). It can therefore be afforded even by the economically weaker sections.

The Bihar programme conceived and implemented by Sulabh International drew the attention of WHO, South Asia Region, Delhi. Greatly impressed with the Sulabh's modified design of two pit pour flush waterseal latrine with on-site sanitation popularly known as "Sulabh Shauchalaya" and its organisational activities, in 1997 WHO decided to study in depth the actual situation at site. An expert mission of WHO visited Patna. By that time Sulabh International had already converted 10,000 bucket privies into twin pit pour flush waterseal latrines (Sulabh Shauchalayas) in the most congested areas of the city of Patna and 40,000 in other towns of Bihar. The mission observed that to make the programme successful, a dedicated effort towards promotion, motivation, publicity and health education is needed to create awareness among the beneficiaries. The mission learnt from the Director of Health Services, Bihar that Shauchalayas constructed by Sulabh International had not caused any health hazard to the community wherever they had been adopted.

The WHO and the Ministry of Works and Housing (now Urban Affairs and Employment), Government of India in collaboration with Sulabh International and UNICEF convened the first National Seminar on Conversion of Bucket Privies into Sanitary Waterseal Latrines in May, 1978 at Patna. It was attended by public health engineers, public health specialists, scientists, administrators, planners and decision makers from all the States and Central Governments because of the multi-disciplinary nature of work. Based on the deliberations, and observing the work done by Sulabh in Bihar, the seminar concluded that two pit pour flush latrines with on-site sanitation popularly known as Sulabh Shauchalaya is the most appropriate low cost technology to be introduced on a large scale in the urban areas of the country.

In 1979, when the UNDP/World Bank took up the proposal for demonstrating the installation of low cost sanitation on a world wide basis, based on the experience of Sulabh International, the Govt. of India decided that UNDP/World Bank should take up a Feasibility Study on low cost sanitation in India in 211 towns spread over in 21 States and Union Territories. Various studies were carried out by the UNDP/World Bank of the Bihar programme, investigation of various technical features and the study of pollution from the existing leach pits. The convincing data based on actual work done in varied physical, hydrogeological, socio-cultural and economic situations in Bihar provided useful material to draft the Feasibility Reports on low cost sanitation. Thus it is Sulabh International's successful achievement that showed the path for adoption of low cost sanitation system on a large scale, which was finally accepted all over India.

The Government of India, State Governments, various national, international and bilateral agencies like UNDP, UNICEF, World Bank, WHO, UNCHS, HABITAT etc. have acknowledged that Sulabh Shauchalaya is the most appropriate low cost technological option to improve the environment and quality of life of the people. They have suggested its adoption in India as well as in other developing countries.

POLLUTION ASPECT

Although Sulabh Shauchalayas are being advocated, yet the dangers of water pollution from the leach pits are often raised by several authorities desirous of adopting this system. The apprehension of ground water pollution is considered to be a deterrent factor in adoption of this system. The pollution problem has been studied in great detail both in India and abroad, although further studies are underway to evolve a more economical design to prevent pollution under different hydrogeological conditions. However, it has been conclusively proved that with due precautions, Sulabh Shauchalaya system can be safely implemented in almost all hydrogeological conditions.

To ensure that the risk of polluting ground water and drinking water sources is minimal, the following safeguards should be taken while locating the pits :

- i) Drinking water should be obtained from another source or from the same aquifer but at a point beyond the reach of any faecal pollution from the leach pits.
- ii) If the soil is fine (effective size 0.2 mm or less), the pits can be located at a minimum distance of three metres from the drinking water sources, provided the maximum ground water level throughout the year is two metres or more below the pit bottom (low water table). If the water table is higher, i.e. less than two metres below the pit bottom, the safe distance should be increased to 10m.
- iii) If the soil is coarse (effective size more than 0.2 mm), the same safe distance as specified above can be maintained by providing a 500 mm thick sand envelope, of fine sand of 0.2 mm effective size, all around the pit, and sealing the bottom of the pit with impervious material such as puddle clay, a plastic sheet, lean cement concrete, or cement stabilised soil.
- iv) If the pits are located under a footpath or a road, or if a water supply main is within a distance of three metres from the pits, the invert level of the pipes or drains connecting the leach pits should be kept below the level of the water main, or one metre below the ground level. If this is not possible due to site considerations, the joints of the water main should be encased in concrete.

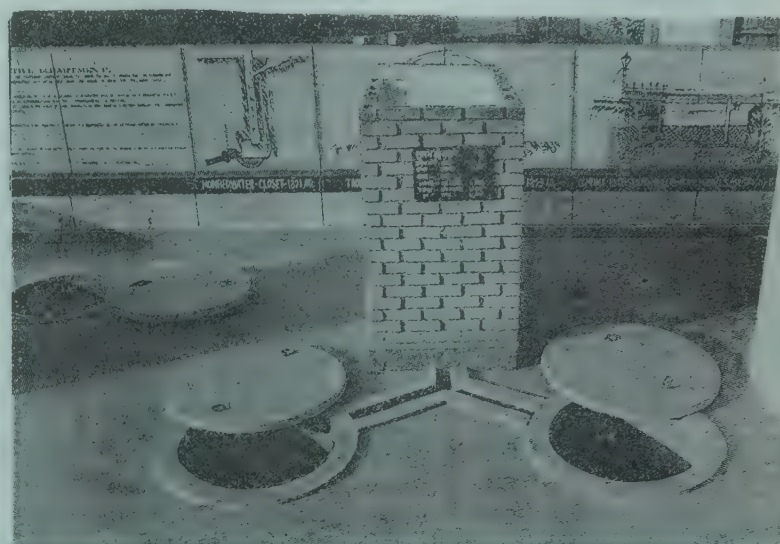
THE RATIONALE : LOW COST SANITATION-VIS-A-VIS SULABH SHAUCHALAYA

The Eighth Plan (1992-97) document envisages the concept of "total sanitation", covering primary health care, water availability, women's welfare, immunisation and provision of sanitation facilities all linked to cleanliness as a basic human need. It emphasises that every effort will be made to adopt a low-cost approach employing technical and scientific know-how and experience already gained by several non-governmental organisation in this regard.

It is against this background that the role of Sulabh and other NGOs in terms of sustainability, affordability and replicability for environmental upgradation in urban areas needs to be assessed. In a way, the country document admits the inevitable acceptability of low-cost approach. Also, it acknowledges the role played by NGOs like Sulabh unreservedly.

In 1985, Dr. Raja J. Chelliah, the then Member of Planning Commission, had observed that "with limited resources and an unabated rush to larger cities, search for low cost solutions, therefore, is a matter of priority. It has generally been accepted that India has two major areas for replication in this regard, namely, the urban community development programme and the low-cost sanitation project programme through the pour flush twinpit latrine as in operation in a large number of States in India". Sulabh's pioneering efforts in popularising low-cost sanitation latrines have been commended widely.

Indian planners and NGOs working with people to accelerate the pace of progress of human development have unequivocally recognised that although more than nineteen types of human excreta disposal system have been identified the world over, only three systems are found to be suitable for adoption in India. These, in descending order of quality performance and acceptability are (i) the high cost local government managed sewerage system (ii) the medium cost household managed septic tank system and (iii) the low cost individual household and water friendly and multi-beneficiary pour flush water seal sanitary compost latrine or household toilets, popularly known as Sulabh Shauchalaya. Conventional sewerage, an ideal solution for disposal of human excreta and waste water satisfies most of the public health criteria and is also convenient. But, it requires large quantities of water for proper functioning. The capital cost of sewerage construction, including waste treatment is very high. Besides, operation and maintenance cost is also quite high. Although sewerage had been introduced in India about 120 year ago and most of the plan allocations for urban sanitation have been spent on sewerages yet only 232 towns and cities out of 4689 are served by sewerage. In most of them, the sewerage system does not cover the entire municipal area, leave alone the adjoining suburbs included within municipal limits. The first two categories are socially more accepted systems and all major cities and towns exceeding one lakh population have perspective plans already for full sewerage system including upgrading of septic tanks, notwithstand-



The 2-pit pour flush sanitation system is a cost-effective solution for individual toilet.

ing excessive construction and maintenance cost. Also, this option is exercised despite huge unrealisable targets, made difficult by a continued rush to urban areas. It has been acknowledged in various studies, corroborated by the observations in the present study, that untreated or partially treated sewerage and badly maintained systems could precipitate health hazards and septic tank are seldom free of mosquitoes.

Consequently, a wider applications of household toilets or Sulabh Shauchalayas, available in different models and designs suited to every range of user costing from Rs. 500 for five users with two year capacity pits to Rs. 5000 for ten users with twenty years capacity (excluding superstructure), etc. are available. These models have already been implemented by Sulabh in Bihar, Madhya Pradesh, Uttar Pradesh and Rajasthan among the economically weaker section (EWS) low income group (LIG) and middle income group (MIG) people. All these models and designs of Sulabh have been technically tested and implemented in different geophysical conditions. As these models are affordable to different income groups of people, particularly to economically weaker sections, the effective demand for household toilets or Sulabh Shauchalaya increased over the years and it had its spread effects in many towns/cities of 18 states and two union territories of India as the 'best practice' acceptable to the people and local bodies.

The other method of excreta disposal is the septic tank which is beyond the reach of the common man; it costs two to three times more than the household toilets or Sulabh Shauchalaya.

SPECIFIC ADVANTAGES OF SULABH SHAUCHALAYA OVER SEPTIC TANK ARE :

- i) Septic tanks have to be cleaned after every one-or two-years interval and wet sludge has to be taken out, which has fresh human excreta floating at the top and emitting obnoxious smell. It needs the services of scavengers for desludging, since the ordinary labour-

er will not be willing to handle it as it is mixed with fresh excreta. If desludging operation and disposal is not handled properly, it is a health hazard. Since the Government of India has already brought into force the Employment of Manual Scavenger and Construction of Dry Latrines (Prohibition) Act 1993 banning scavenging as such, desludging of a septic tank will pose a serious problem.

- ii) Services of scavengers are not needed in the case of Sulabh Shauchalayas. The pits can be cleaned by the householder himself or any labourer because the excreta is completely digested and safe for handling after one and a half years of disuse of filled up pit.
- iii) The maintenance of Sulabh Shauchalaya is easy and simple and costs little, whereas emptying of septic tank cost much. In case of Sulabh Shauchalaya, part cost of emptying can be met from the sale of sludge as direct fertilizer taken out from the pit.
- iv) Septic tanks have to be cleaned immediately on filling so as to allow uninterrupted use of toilet. In the case of Sulabh Shauchalaya, since one pit is used at a time, the filled up pit can be deslugged at the convenience of the householder after one and a half years rest period, when the digested sludge is safe for handling and does not cause any health hazard.
- v) Although ISI code states that under no circumstances should effluent from a septic tank be allowed into an open channel, drain or body of water without adequate treatment, this is seldom done resulting in foul odour, fly and mosquito nuisance, health hazards and environmental pollution. The municipal bye-laws prohibit discharge of septic tank effluent direct to open drains or body of water but this provision is not strictly enforced due to various reasons. In Sulabh Shauchalaya, there is no such problem because liquid infiltrates into surrounding soil through the holes in pit lining.
- vi) Every septic tank is required to be provided with ventilating pipe so as not to cause smell nuisance. The emission of foul smell through the vent pipes pollutes the atmosphere. In Sulabh Shauchalaya no vent pipe is required as gases are dispersed into the soil.
- vii) There is shortage of drinking water in almost all the urban and rural areas of the country; hence water has to be conserved. Septic tank latrine usually needs 14 litres of water for flushing, whereas Sulabh Shauchalaya needs only one and a half to two litres of water.
- viii) Septic tank latrine requires more space than the pour

flush toilet. The design of Sulabh Shauchalaya has the flexibility, it can be designed to suit site and household requirements.

- ix) Sulabh Shauchalaya with twin pits has potential for upgradation. It can be connected to sewerage system easily; only leaching pits will become infructuous, whereas in septic tank latrine, the septic tank and effluent disposal system will become infructuous, which is costs two to three times more than the leach pits of a Sulabh Shauchalaya.
- x) The sludge and effluent from a septic tank cannot be used as manure directly without causing health hazards, whereas the sludge of the leaching pit is almost dry, odourless and safe for handling after about one and a half years of rest period; hence it can be used immediately after it is taken out. It is also a very good manure and soil conditioner.
- xi) The construction of Sulabh Shauchalaya is very simple and can be constructed by any mason with a little training, whereas skilled masons are needed for construction of a septic tank of proper design.

Sulabh Shauchalaya innovative models developed and implemented by Sulabh International with low cost technology are affordable and acceptable to the people because of their proper monitoring and effective delivery system.

The present study also supports the statement of Shri Mulk Raj Anand (Foreword, Restoration of Human Dignity 1994), that "the Sulabh International invention of dry latrines, which is flushible with one Lota of water, is revolution which now becomes imperative to adopt throughout the country". It has also been revealed through the findings of this study that the Sulabh flush has helped the scavengers in many parts of the country to free themselves from demeaning work. It is estimated that about 35,000 scavengers have been relieved of scavenging and enabled to seek alternate employment either in the local body establishment itself or elsewhere. Of the relieved scavengers, about 3,406 were trained by Sulabh itself to acquire job oriented skills. The integrated approach which the low cost sanitation programme emphasises is brought about by Sulabh through innovative initiatives. This research study based on 'Indian Experiences' went into this holistic approach in some detail.

The contribution of Sulabh International and some localised NGOs in attaining satisfactory levels of urban environment has been confirmed by the study. In the task of capacity building to tackle problems of urban environment, a co-ordinated approach is needed. The avowed objective of the Government of India to eliminate scavenging by the end of the Eighth Plan (1992-97) itself is the most evident sign of the feasibility of conversion of dry latrines and the efficiency of low cost ones on Sulabh Shauchalaya models. The ambitious Eighth Plan

national scheme of Rs. 464 crore for rehabilitation of scavengers again points out to the lead provided by Sulabh International to train and rehabilitate scavengers and their dependents.

To sum up, the present study has established that :

- i) Sulabh system qualifies on all counts as the 'best practice' in India to provide alternate integrated low cost sanitation facilities thus contributing towards capacity building to tackle urban environmental problems;
- ii) urban slums need much more attention;
- iii) community toilet complexes, though acceptable to the people need extensive promotion for installation at strategic urban centres to control pollution;
- iv) gender-specific facilities need to be augmented; and
- v) bio-gas plants based on night soil are still to be promoted in a big way as a source of non-conventional energy resource and utilization of waste material in urban areas for environmental upgradation.

GENDER ISSUES

Gender equality in matters of economic, social and political significance is a fundamental right guaranteed by India's Constitution to the 450 million Indian women, who form roughly one - sixth of the world's female population. India is one of the few countries which has a highly creditable record in regard to enactment of laws to protect and promote the interests of women. Using a Gender-related Development Index (GDI), the 1995 Human Development Report of UNDP places India in the 99th position among 130 countries in relation to the status of women. In dealing with sanitation and environment matters, attention has necessarily to be given to removal of hurdles that impede full participation of women. The present survey has revealed certain shortcomings in implementation of low-cost sanitation programmes that adversely affect women beneficiaries.

No doubt women were consulted in deciding the location of P.F. latrines. They were also informed about their usefulness before constructing them. They were made fully aware and even appreciated the harmful effects of open defecation or for that matter about the use of dry latrines on health and environmental grounds.

Though they know about the use and maintenance of PF latrines, many of them were not using them in the absence of superstructures. They were thus compelled to go for defecation in the open. Until and unless privacy for women is ensured by constructing the superstructure on PF latrines, women would have to go for open defecation.

As for community latrines, the women were consulted before construction of community latrine in their locality. They were informed about the usefulness of community complex and it was explained as to how it would improve environment and sanitation of the locality. But when they were asked whether the implementing agency had organised any training camp on health and hygiene and use of community complex, the respondents of majority of the towns stated that such training camps were not organised. Only in Madras, Bangalore and Puri such training camps were organised which were attended by 70 percent, 35 percent and 50 percent respondents, respectively.

When they were asked whether privacy and security of women was maintained in the community complex, they reported that there was no problem about security because there were women attendants in the complex. However there existed a problem of privacy. The survey reveals that there is lack of awareness and motivation amongst the women, particularly in slum areas as to how the effective use of household toilets and community toilet complexes could keep them and their family healthy to improve the quality of their life. Women's active participation in LCS programme is vital because the hygiene and sanitation of the entire family depends upon their awareness and motivation.

The survey has revealed that for maximising the use of LCS facilities in general and women and children in particular; the following observations need to be looked into :

- i. Accessibility : location of the community facilities should be near to residences
- ii. User charges : The system of per person per use charge should be replaced by affordable monthly payment for the entire family
- iii. Availability of water and electricity : There should be water supply for 24 hours. The complexes should be electrified to allow use in the night.
- iv. Separate latrine seats for children : Each complex should have adequate number of seats for children.
- v. Bathing facility : Adequate bathing facilities should be provided for women.
- vi. Adequate number of toilet units : The number of toilet units should be provided keeping in view the number of expected women users of the locality. More seats in the complex could be arranged for women so that the waiting period could be reduced. This would facilitate women to attend more efficiently to their household duties related to child care, cooking, etc. As to the timing, most, of them preferred early morning and evening as it suited them most.

Although community toilet complexes have separate enclosures for women but the main entry point is common for male and

female. Women preferred to have a separate entry point. It was gathered that if such arrangements could be made, more women of the locality might use the complexes.

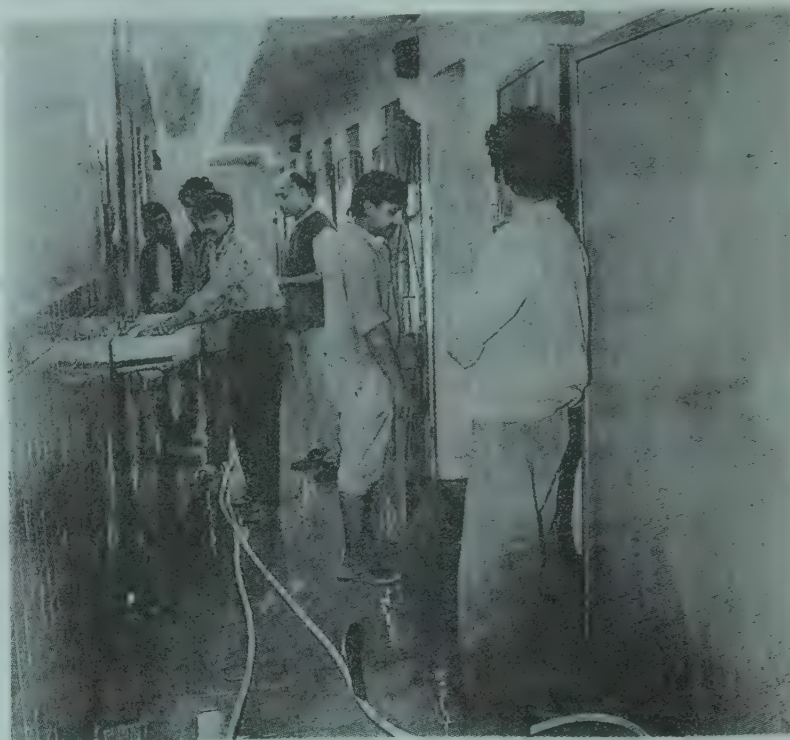
ANALYSIS OF THE RESULTS OF THE SURVEY

The information gathered through the survey on various facets of household toilets (surveyed in twelve towns/cities) and community toilet complexes (surveyed in fourteen towns/cities) provide a vivid picture of the facilities under low-cost sanitation programme.

The analysis clearly show that NGOs efforts in awareness campaigns have had the desired effect. An important aspect relevant to the situation in urban India is the composition of the so called weaker sections in the beneficiary group. Sulabh attends to more or less the same proportion of their population as their share in the country's population, the other NGOs in fact cater to more than their share. Another inference is that the slum population in the surveyed towns has substantial component of these weaker groups. This observation is further corroborated in terms of economic status through Table 4.8. While the 'poor' constitute one fifth of the total beneficiaries, it is the group in Rs. 1251 to Rs. 2500 income bracket which dominates the scene. In fact both Sulabh and other NGOs attend to the same proportion of 'poor', the former caters to a larger proportion of the next category of 'less poor' (1250-2500) than the latter. These two groups account for eighty percent of the low cost sanitation beneficiaries in the surveyed towns. The inference is that the package under 'low cost sanitation', serves the target group in an undisputed manner. These three characteristics, (i) caste composition (ii) income levels and (iii) nature of habitations proclaim loudly the relevance of low-cost sanitation to the Indian situation. The other Tables presented in this study are self-explanatory which establish the living style and satisfaction levels of minimum needs of the household toilet beneficiaries in the surveyed towns thereby providing an overall profile of the users of the low-cost sanitation measures. In particular, through Tables 4.8 and 4.9, it has been established that the practice of open defecation continues unabated and that the inference is that more concerted efforts, through acceptable low cost sanitation package, would be needed to improve urban environment.

In regard to community complexes, it has been again established that these facilities largely meet the needs of poorer sections in the society in that 70 percent of the users are in the monthly income category not exceeding Rs. 2500/- The conclusion is that such facilities provide much needed benefits to a substantial population and contribute in maintaining clean environment.

A study of the information contained in Table 4.10 establishes the fact that less the access to individual household latrines, the more the use of community complexes by women. This leads us to suggest that till such time individual household latrines can be provided in an adequate manner, the network of community complexes with sufficient arrangements for use by fe-



Community complexes meet the needs of poor and floating population.

males must receive priority attention. The survey also shows that in the towns served by community complexes managed by Sulabh, the users have faced less difficulties.

In brief, the study establishes the fact that both household latrines and community complexes under the low-cost sanitation banner have contributed in improving urban environment and that in this endeavour both Sulabh and other NGOs have had an important role though the involvement of Sulabh has been more than other NGOs in the overall national context.

SURVEY FINDINGS OF TOWNS : HOUSEHOLD TOILETS

Out of 1649 respondents in twelve towns, 81 percent male respondents and 19 percent female respondents were interviewed. The survey findings revealed that 36 percent respondents obtained education below primary level, 26 percent upto high school and 12 percent above high school levels. The remaining 26 percent were illiterate. The percentage of illiteracy among the respondents was as high as 63 percent in those areas of Hyderabad where the NGOs other than Sulabh had constructed PF latrines. Among these respondents it was also found that 52 percent belonged to SCs, the overall percentage of respondents belonging to SCs, STs and others worked out to 20, 74 and 6 respectively.

With regard to income, it was found that 61 percent of the respondents of 1649 households had household monthly income between Rs. 1250 and Rs. 2500, 14 percent between Rs. 2501 and Rs. 4000 and only five percent above Rs. 4000. The percentage of low income group below Rs. 1250 was 20 percent. The percentage of households having income below Rs. 1250 was as high as 52 percent in Madras and as low as 4 percent in Ambattur.

With regard to occupation, it was found that the percentage of workers in twelve towns was 83 percent and the percentage of non-workers 17 percent. Among the workers, 32 percent were engaged in service, 47 percent in business and four percent in farming. There were 51 percent joint families as against 49 percent nuclear families.

With regard to characteristics of the respondents habitations; it was found that 21 percent were living in slums, 39 percent in slumlike situation and two percent in unauthorised colonies. The remaining 38 percent were living either in newly developed area or developed colonies. The percentage of respondents living in slums was nearly fifty or above in Bhopal, Madras, Ambattur and Gonda. With regard to types of housing, out of the total households in the twelve towns, 80 percent had either pucca or semi pucca houses and 20 percent were living in kutch houses. The percentage of kutch houses was as high as fifty in Bhopal and forty-four in Madras.

Piped water and handpumps are the major source for drinking and other purposes. The overall percentage of piped water and hand pumps in the twelve towns/cities was 80 percent. However, in Madras 48 percent depend on other sources. The people faced acute shortage of water.

With regard to location of PF latrines, it was found that 59 percent of the households had got their PF latrines constructed outside the covered area but within the premises and about 30 percent had got their PF latrines constructed in covered area in Verandah. Eleven percent had their PF latrines either outside the premises or attached to their rooms.

It was found that the women and children of 79 percent of the households were using PF latrines and 21 percent were not using. However the percentage of these households varied a great deal in respect of individual towns. In some towns like Ajmer, Ambattur and Gopalganj, the women and children of a large number of households were not using PF latrines. It was as high as 42 percent in Ajmer, 40 percent in Ambattur and 34 percent in Gopalganj. The main reasons for not using them were inhibition on the part of women, reluctance of children due to old habit of defecation outside, the absence of superstructure and apprehension of the pits getting filled up due to their small size.

Among women and children not using PF latrines, 67 percent of the respondents of sample households stated that women went to open field for defecation, 14 percent stated that the children used roadside for defecation and 11 percent stated that their children used open drain for defecation.

Only about eight percent sample beneficiaries observed technical defects in their latrines. However, the percentage of defects observed was substantially high in respect of two towns, namely Ambattur and Barwani. In Ambattur 45 percent had observed technical defects and in Barwani 31 percent had observed the same. In Madras and Gopalganj no beneficiary had observed any defect.

About 86 percent of the respondents felt satisfied with the PF latrines and 14 percent expressed dissatisfaction. However, the percentage of sample respondents expressed dissatisfaction was substantially high in Ambattur and Barwani. In Ambattur 51 percent expressed dissatisfaction with PF latrines and in Barwani 41 expressed similar dissatisfaction. Those who expressed satisfaction stated that scavengers were not needed for cleaning the PF latrines, privacy and security was maintained, foul smell was not emitted and less water was required. The reasons for dissatisfaction were absence of superstructure and installation or construction of small pits.

In the absence of meaningful comparable data in respect of eight towns where Sulabh had constructed PF latrines, our analysis covers the five towns where other agencies had constructed PF latrines. With regard to construction of superstructure on PF latrines located outside the covered area, 62 percent had got the superstructure constructed and the remaining 38 percent had no superstructure. However, the percentage varied between the towns. It was as high as 88 percent in Gopalganj and as low as 19 percent in Ambattur. Among those who had superstructures, 87 percent got the superstructure constructed by themselves. With the exception of Ambattur and Gonda almost all had got their superstructure constructed by themselves.

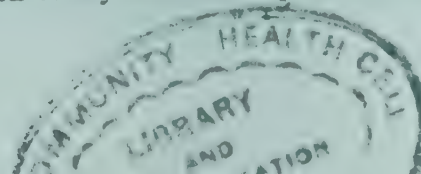
With regard to types of superstructure constructed by themselves, 60 percent had pucca superstructure and the remaining 40 percent had katcha superstructure.

Although the exact number of superstructures built on PF latrines constructed by the Sulabh was not gathered, it can be stated that the majority of women were not using the PF latrine owing to non-existence of superstructure.

With regard to construction of PF latrines by different agencies it was found that out of the total sample households in five towns, 66 percent had got their PF latrines constructed by NGOs, 23 percent by municipality, about eight percent by private contractors, three percent by self and others. However the percentage varied between the towns. In Ambattur, Gopalganj and Hyderabad it was mainly the NGOs who had constructed the PF latrines. In Barwani, it was primarily the municipality which did the construction, while in Gonda, various agencies had constructed the PF latrines though about 50 percent households had PF latrines constructed by private agencies.

When asked whether the household members were consulted in planning and implementation of the latrines, 46 percent households stated that they were consulted, and the remaining 54 percent stated that they had not been consulted. However, the percentage of households in five towns varied a great deal. In Hyderabad only about three percent were consulted while in Gopalganj 98 percent had been consulted.

When the respondents were asked to state the reasons for conversion of dry latrines, 48 percent stated that it was more



convenient to use PF latrines, 21 percent stated that it would not adversely affect the health, 18 percent stated that they were dissatisfied with the scavengers service and their service was expensive. Another four percent stated that the privacy of women could be maintained.

SURVEY FINDINGS OF TOWNS : COMMUNITY COMPLEXES

Educational level of the beneficiaries of the community complexes in different towns varied a great deal. The overall percentage of 593 beneficiaries as per levels of education were (1) primary level 26%, (2) upto high school 41% and (3) above high school 11%. The overall percentage of illiterate beneficiaries worked out to about 12. However, the percentage of

illiteracy was as high as 83 in Ambattur, followed by Gopalganj and Barwani where the percentage was more than 50.

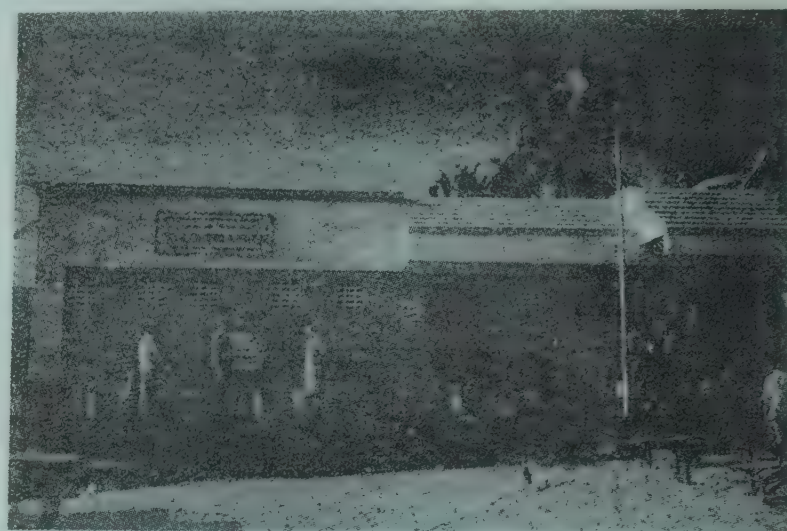
The majority of beneficiaries were engaged either in service or business in all the towns except in Gonda. The overall percentage of beneficiaries engaged in service was 36 and in business 58 percent. The percentage of housewives was only seven percent. The students and children constituted three percent. The percentage of unemployed was insignificant. However the percentage of housewives was as high as 55 in Gonda, followed by Hyderabad (other NGO) and Barwani.

With regard to income, 30 percent of the beneficiaries belonged to monthly household income category below Rs. 1250, 19 percent belonged to income category between Rs. 2501 and Rs. 4000, and 11 percent belonged to income category above Rs. 4000. However this percentage varied a great deal in respect of individual towns. The monthly household income level of the beneficiaries in three towns, namely, Ambattur, Barwani and Gopalganj showed that largely the beneficiaries belonged to income category below Rs. 1250.

In the fourteen towns, 389 beneficiaries (66 percent) were local and 227 (34 percent) were commuters. Our household survey analysis was limited to local beneficiaries only because it was they who used these complexes more regularly.

With regard to housing, 50 percent of the beneficiaries had pucca houses, 13 percent semi-pucca houses and 36 percent katcha houses. In some towns like Ambattur, Barwani, the percentage of beneficiaries having katcha houses was quite high. In some towns like Madras, Jammu, Bangalore, Ajmer and Hyderabad the percentage of beneficiaries having pucca houses was quite high.

Out of 389 respondents using the community complex, 42 percent beneficiaries had individual household latrines and 58 percent did not have such latrines. The percentage of beneficiaries having individual latrines was as high as 96 percent in Bangalore and as low as 3.3 percent in Bhopal. When the respondents were asked whether the women of their households



Pay-and-Use Community Complex contributes significantly towards Environmental Improvement.

were using the community complex, 64.3 percent stated that they were not using the community complex. The percentage of households whose members were using the complex was as high as 87 percent in Bhopal, followed by Gonda, Bombay and Puri. It was below 20 percent in Ajmer, Jammu, Bangalore, Mirzapur and Patna. It was found that the lower the percentage of individual household latrines in a town, the higher was the percentage of women users of the community complex, and vice-versa. For instance, the percentage of households in Bhopal having individual latrines was only 3.3 but the women of 87 percent households were using the complexes. Similarly in Bangalore women of only 13 percent households were using community complex because 96 percent of the beneficiaries had individual latrines.

The survey findings revealed that 41 percent of the beneficiaries of the sample households were using the complex for only toilet, 24 percent for urinal and toilet, 13 percent for toilet and bathing, 19 percent for all the three types of facilities. The percentage of beneficiaries using them for bathing or urinal only was insignificant.

When the respondents were asked whether they had ever encountered any difficulty in the use of the complex, it was revealed that 21 percent of the respondents of the total sample households faced difficulties. It has to be noted that 95 percent in Ambattur, 65 percent in Jammu, 67 percent in Gonda and 56 percent in Barwani faced difficulties while in Patna, Bangalore, Hyderabad and Gopalganj none had faced any difficulty.

GENERAL OBSERVATIONS

The status of scavengers' liberation programme in case studies of fourteen selected towns/cities reveals that public scavengers, who were servicing dry latrines, have been absorbed in the local bodies as sweepers, gardeners, etc; their dependents are getting financial assistance for education and vocational train-

ing in different trades, who are mostly reported to be self-employed. But most of the private scavengers, who were servicing dry-latrines are even now engaged in the same job though secretly, where dry latrines exist. None of the municipalities and corporations of the surveyed cities and towns could provide information with regard to status of number of private scavengers and the number and nature of different types of latrines presently existing.

The general observations of the case studies of fourteen selected towns/cities reveal the problems encountered in implementation of the programme which relate to lack of co-ordination at the central, state and particularly at local levels of administration and management; delay in furnishing state Government guarantee for loan approval for LCS causing delay in sanction of loan by HUDCO as well as problem of release of subsidy amount by Ministry of Welfare for training and rehabilitation; non-availability of exact details of category-wise beneficiaries and number of scavengers to be liberated, trained and rehabilitated; non-availability of exact details of different types of latrines presently existing in the cities and towns for programming conversion/construction of low cost sanitation measures; lack of technical personnel for preparation of project reports and to monitor implementation of the programme; improper selection of implementing agencies for carrying out both programmes in small and medium towns; and last but not the least lack of effective arrangement to provide services for household toilets and suitable land for community toilet complexes. It is reported that due to various problems in implementation, physical achievement is not up to expectation.

The survey of selected towns/cities further indicates general acceptability and effective use of both the household toilets and community toilet complexes as 'best practice', followed by Sulabh International which have potential for not only replicability but also for creating long term impact in improving urban sanitation situation and health care of the people living in urban environment. This is because Sulabh takes entire responsibility of implementing the LCS from inception to the provision of facilities including maintenance and follow up with the guarantee of five years to the beneficiaries of household toilets. Moreover, it ensures community toilet complexes it owns responsibility for thirty years for operation, maintenance and upkeep without any liability on local bodies. On the other hand, the survey findings indicate that such methodology has not been adopted by NGOs, other than Sulabh, causing delay in implementation and dissatisfaction among the beneficiaries.

FORMULATION OF NATIONAL STRATEGY

CAPACITY BUILDING FOR URBAN ENVIRONMENT

The urban population of 21.7 crore,⁴ about 25% of India's total population of 84.6 crores in 1991 census (with growth rate of 2.14% per annum between 1981-91) is a vital concern to plan-

ners and policy makers. If the urban growth trend continues unabated, it is extrapolated that by the turn of the century, urban population may be one-third (about 33%) including more than 50% of slum and pavement dwellers and squatters of India's total population. The urban population is spread over 4696 urban settlements. The number of cities with a population of one lakh plus increased from 216 in 1981 to 300 in 1991 census. These cities account for 65 percent urban population. The growth of population in medium and small towns follows, more or less, the same trend. About 1292 medium towns (above 20,000 to one lakh size) share 24 percent, and the remaining 3104 small towns (less than 20,000 population size) constitute 11 percent of the urban population. The problem of excessive urbanisation and industrialisation leading to growth of slums (particularly in megapolis and metropolis and also in medium and small towns) has been causing insanitation and diseases with contaminated water supply, insanitation and mounting piles of filth due to lack of inadequate system of garbage disposal. Consequently, urban environmental degradation is visible to a greater or lesser extent in practically all cities and towns.

SEVENTY FOURTH CONSTITUTION AMENDMENT ACT (1992)

In the present scenario, the capacity building for urban environment management by local bodies (corporations and municipalities) calls for different urgent options. Presently, more or less, all local bodies are entrenched with the problems of lack of finances, motivation and coordination among different agencies concerned with governance and management of even the basic sanitation and health needs of the people in cities and towns. Their task is monumental. And, the prerogative of authority of decisions, governance and management of civic affairs are limited and/or insignificant, because these are delegated to or retained by state governments as custodian of local finances and power of governance.

The Seventy Fourth Constitution Amendment Act (1992) pertains to decentralised planning in local bodies (metropolitan and municipal areas) in India. The smallest urban settlements from 100 to 200 families and more, or service centres in metropolises above one million population constitute a hierarchy linked in many ways (such as socio-economic and socio-cultural heterogeneous population). Hence, planning for people living in urban settlements would mean a change in habit, attitude and behavioural pattern (of heterogeneous migrants). Besides, the planning process will need participation of the people, particularly women and the poorest sections (the scheduled castes, scheduled tribes and backward classes) in the governance of their civic affairs in urban areas where they live.

The participation of the NGOs along with residents welfare associations has been shown to be one of the most fruitful avenues to bring about the amelioration of urban environmental conditions (in urban pockets and slums) by implementing integrated low cost sanitation cum scavengers' liberation programme. The NGOs have also implemented low-cost technology, for example, bio-degradable solid waste have been sepa-

⁴ 1 crore : 10 million

rated for the production of bio-gas for cooking and mini-thermal power; deep tubewells are being excavated to supplement the declining water supply; street sanitation, drainage, and sewerage is being established and maintained by neighbourhoods; and last but not the least, the flood of people to urban areas (particularly in slums) cannot only be stemmed but also be reversed using the same family chains that brought the rural poor to metropolitan and other urban areas. Indeed, this needs unflinching and dedicated efforts of the NGOs/voluntary organisations.

The Seventy Fourth Constitution Amendment Act (1992) therefore, raises more critical issues and doubts, for institutions of self-government to function effectively in the absence of complete autonomy to sensitize essential and desirable components, ensuring 'capacity building for urban environment management.' Thus, the components for institutions for local government/bodies should be (a) clearly demarcated areas of jurisdiction vis-a-vis central and state governments (b) adequate empowerment of power and authority in consonance with the responsibilities of development needs (c) ensured power and authority to raise and/or increase financial and human resources to manage civic affairs in terms of priorities (particularly sanitation and health affairs) and (d) complete functional autonomy to coordinate and monitor the civic affairs in active collaboration with NGOs/voluntary organisations and residents welfare associations.

NATIONAL STRATEGY

The Seventy Fourth Constitution Amendment Act (1992) has therefore to be reviewed for evolving a National Strategy with a fresh look at legislative measures for operationalisation of urban environmental programmes.

Among the possible approaches, for early solution, one could include :

1. Supplementing governmental efforts through privatisation and massive involvement of committed NGOs/voluntary organisations having track record in planning, development and management of :
 - (a) conversion/construction of household toilets and community toilet complexes
 - (b) garbage and sewage collection and disposal;
 - (c) propagation and dissemination of information, education and communication (IEC) for changing the habits, attitude and behaviour of people migrating from different linguistic, socio-economic and socio-cultural backgrounds;
 - (d) slum-improvement programmes;
 - (e) low-cost sanitation technology, especially for accelerating the process of items from (a) to (d)

- ii. Ensuring community participation particularly women involvement
- iii. Effective coordination of different actors at the local, state and central levels along with NGOs.
- iv. Imaginative changes in the municipal/local bodies bye-laws for the use of infrastructure support, including financial support to the NGOs.
- v. Meaningful land-use planning, and
- vi. Gender specific approaches to fully meet the needs of women, especially in relation to security and privacy, more specifically in urban slums.

CAPACITY BUILDING AND INSTITUTIONAL STRENGTHENING

It is the primary responsibility of the local authorities to look after sanitation in their areas. Their resources being meagre, they are unable to meet the increasing demand. The local authority can therefore, get the sanitation programme implemented either through the State Government Engineering Department or Board incharge of water supply and sanitation or by awarding the work to a contractor or an NGO. The Government engineering department and many local bodies are strong in hardware but have no infrastructure for software which is an important input needed for the success of LCS programme. Many of the local bodies do not have technical persons and even where they are available, they remain busy in their day-to-day work with the result they are unable to pay due attention to the LCS programme.

The beneficiaries prefer an agency which is prepared to undertake the entire responsibility for the construction of toilet and the follow-up. Responsible and well established contractors are not interested in a project of this type, because the margin of profit is too small and the work is very time consuming being dependent on the convenience of the householders scattered throughout the town. The main motive of the contractor is profit making. Moreover, once the toilet is constructed, he does not bother about it. There is no follow-up. Hence people are not satisfied with the work carried out by the contractors.

For the implementation of social programmes like sanitation, NGOs with experience in the field of low cost sanitation are best suited. They work as a link and provide a transmission line between the people, the local authority and the Government. They motivate, persuade and popularise programmes and projects by bringing about attitudinal and behavioural changes and involving people in community projects. The active participation of the people ensures greater chances of success and cost-effectiveness than total dependence on the Government when people tend to become passive. The non-involvement of the people has also let them to always look to official agencies for help and thus lose private initiative. NGOs

organise communities and mobilise people's active participation. Women's involvement is also ensured at every stage of implementation.

Even when the LCS programme is implemented by the NGOs, the local authorities have to carry out certain functions. They will be responsible for :

- i) Preparation of budget
- ii) Training of personnel involved in the implementation of LCS
- iii) Preparing detailed programme of work
- iv) Processing of applications for construction of household latrines and execution of agreement with the householders for repayment of loans
- v) Receipt and disbursement of loans and subsidies
- vi) Supervising all construction operations to ensure that the works executed conform to prescribed designs and specifications
- vii) Monitoring for regular surveillance of project activities and to find out operational problems to solve them
- viii) Recovery of loans from the beneficiaries and repayment of loan taken by the local body for LCS
- ix) Providing pit emptying service to households on request and
- x) Attending to complaints of latrine adopters after implementing agency's warranty period is over.

For carrying out the above duties, the infrastructure in local bodies will have to be strengthened. The personnel engaged on LCS should not be assigned any other work but should look after LCS exclusively. The duties and responsibility of each should be clearly defined and coordinated.

WOMEN'S PARTICIPATION

Much of the demand for latrines comes from women as they are the worst sufferers due to non-availability of these facilities. Women have by far the most important influence in determining household hygiene practices and in forming habits of their children. So the facilities should be planned with full awareness of their preceptions and needs. Women can persuade male members to have a toilet in the house and pay for it. Women hold the key to the continued operation and effective use of these facilities for the benefit of family's health and better environment. The children can be educated by them to use the toilets. Involving women in water supply and sanitation

programmes, however, requires certain changes in approaches and techniques. Education materials should be geared and designed to suit their socio-cultural habits, beliefs and educational level.

PROMOTION AND HEALTH EDUCATION

The LCS programme offers a new facility to the people, but offering a facility is not an end in itself. It has to be accepted by the people for whom it is meant. People are often not fully conscious of the health hazards of insanitary latrines or open air defecation. Socio-cultural habits, customs and traditions are deep rooted in the society; to persuade the people to change their habits and accept the new technology, promotion, motivation and health education are important and essential inputs to make the programme a success. For this purpose a separate cell manned by suitable and adequate number of persons under social scientists should be created in the local authority or the NGO which is entrusted with the implementation of the LCS should have this infrastructure.

Women motivators and health educators are more useful. The motivators should approach the household individually and educate them about the social and health benefits of the programme. These efforts should be intensified during the initial phase of the programme or when the acceptance rate goes down. The motivation and education campaign should be monitored carefully (noting for example approach to audience, attractiveness and effectiveness) for streamlining and improving the approach.

At present latrine is not a felt need, hence when the community is made aware of the importance of sanitation, the people themselves come forward to demand the facility of latrines and encourage them to actively participate in the programme.

TRAINING MODULE

Although the low-cost technology is easy to implement, yet it requires all the ingenuity and expertise to provide for precision in construction and competence in supervision to guard against faulty construction, faulty practices and pollution, in the construction, use and maintenance of this relatively low cost sanitary device. It, therefore, calls for mounting a well-planned training programme for the personnel involved in the implementation of LCS programme.

The professionals incharge of implementing the sanitation project are mostly trained in conventional approaches. They need to be motivated and trained in the application of low cost technologies and exposed to different choices available in order to ensure rapid progress in expanding sanitation services. This calls for developing trained manpower.

The main task of training should be to sensitize decision makers, educate and train engineers and other personnel in the low cost technologies; to promote multidisciplinary approach em-

phasising socio-cultural and health considerations; and community participation specially involvement of women in planning, implementation and maintenance of sanitation systems.

The training should bring about significant improvements in the effectiveness of sanitation investments and the extension of service coverage particularly to the low income population groups with a perspective of directing the investments towards the use of low cost technologies which are cost effective, affordable, easily available and maintainable, and socio-culturally acceptable.

SULABH'S STRATEGY

Sulabh has been following the above practice in the implementation of low cost sanitation. It approaches people at their doorstep, discusses their problems in their own language and through their cultural medium and finds solutions. Sulabh volunteers go to beneficiaries to know their problem and find out solutions specially to sanitation problems. Once their income level, cultural preferences and indigenous resources position are known, the users are recommended the type of sanitation facilities they should opt for. The organisation takes full responsibility from beginning to end in providing the sanitation facility and also gives guarantee of five years for satisfactory performance. It encourages people to build such facilities on their own and help is given by Sulabh experts. There is a system to ensure quality control and participation of the community specially the women.

Sulabh's innovativeness is best demonstrated in another aspect of sanitation, namely, community pay-and-use toilet system which is a self-sustaining system adopted for the first time in the country. In 1878, the then Bengal Government of British India, had enacted a law to set up the pay-and-use toilet facilities in the city which was then the capital of India. But during the following 100 years nothing was done until Sulabh moved in to revive this concept which has become a roaring success today. Earlier, public toilets used to be the dirtiest places in city centres, but not now. More than 3,000 Sulabh pay-and-use toilet complexes are operating all over the country without any financial burden on public exchequer. Sulabh community toilets have improved the quality of life of poor people specially of the slum and pavement dwellers and have helped local authorities in keeping cities clean.

CONCLUSIONS

At the beginning of Sixth Five Year Plan in 1980-81, implementation of the programme for scavengers' liberation, through low cost sanitation scheme mainly by conversion of bucket/dry privies and construction of pour flush waterseal toilets and training and rehabilitation of scavengers and their dependents was taken up by the Ministry of Welfare, Government of India. This programme was initiated in pursuance of the legislation on Protection of Civil Rights Act, 1955. The expenditure on the programme was shared equally by the central and the state

governments; the local bodies implemented them as per prescribed guidelines. Besides, the Ministry of Welfare, other actors of the Government of India, namely, Ministries of Urban Development and Environment and Forests, local authorities and some NGOs/voluntary organisations were also implementing low cost sanitation programmes with different strategies. In the process, there was lack of coordination in implementation strategy.

For resolving the above issues, a co-ordination committee was constituted at the central level in 1989-90, with HUDCO as convener and composed of the representatives of all concerned Ministries of Government of India. A representative of NGOs, namely, Sulabh International was also invited for consultation. Thus, the Integrated Low Cost Sanitation for Liberation of Scavengers was brought together in a unified manner for implementation since 1990-91. The Ministry of Urban Development became the nodal agency for implementation of low cost sanitation programme, whereas liberation, training and rehabilitation remained with the Ministry of Welfare. The financial pattern for the programmes was modified.

An official report of HUDCO as of May, 1995 provides information on sanction in respect of pour flush household toilets and community toilet complexes under integrated low cost sanitation programmes of the Government of India, covering 996 towns. It has been indicated that from inception in 1980-81 as of May, 1995 a total of 23.93 lakh pour flush household toilets have been sanctioned for conversion of 13.58 lakh dry latrines and construction of 10.35 lakh new PF latrines. Further, 3843 community complexes have been sanctioned. Out of about 7.20 lakh identified scavengers and their dependents in 912 towns, 84,932 scavengers have to be liberated and rehabilitated as of May, 1995. In this, the contribution of NGO-Sulabh International Social Service Organisation is laudable.

The base-line situation of integrated low cost sanitation reveals the monumental task ahead as per 1991 census about 1.4 crore households (36.15 percent) do not have toilet facility in urban India. Consequently, majority of these people are compelled to defecate in the open causing unhygienic environment, contributing to many water borne diseases. Added to this is the abysmal state of sanitation and filth due to garbage and sewage generated every day, more or less, in all urban settlements causing immense damage to social fabric, environmental desirables and health standards. The local bodies administration is not equipped to handle the insanitation situation for lack of financial and manpower resources and poor coordination of different concerned departments from central to state levels. The NGOs also contribute their bit in tackling the situation. What is lacking as a baseline sine-qua-non is responsible co-ordination and monitoring attuned to achieve results.

An all India survey was conducted by the Ministry of Welfare, Government of India for identification of scavengers and their dependents under the National Scheme for liberation, training and rehabilitation. This was done with a view to providing

ultimate employment opportunities to both public and private scavengers. The status of scavengers' liberation programme in case studies of fourteen selected cities and towns reveals that public scavengers, who were servicing dry latrines, have been absorbed in the local bodies as sweepers, gardeners, etc; their dependents are getting financial assistance for education and vocational training in different trades, and are mostly reported to be self-employed. But most of the private scavengers, who were servicing dry-latrine are even now engaged in the same job though secretly, where dry latrines exist. None of the municipalities and corporations of the surveyed cities and towns could provide information with regard to status of number of private scavengers and the number and nature of different types of latrines presently existing.

In brief, the study establishes the fact that both household latrines and community complexes under the low-cost sanitation banner have contributed in improving urban environment and that in this endeavour both Sulabh and other NGOs have had an important role though the involvement of Sulabh has been greater than that of other NGOs in the overall national context.

Indian planners and NGOs working with people have recognised that although more than nineteen types of human excreta disposal system have been identified the world over, only three systems are found to be suitable for adoption in India. These, in descending order of quality of performance and acceptability are (i) the high cost local government managed sewerage system (ii) the medium cost household managed septic tank system and (iii) the low cost individual household and water friendly and multi beneficiary pour flush water seal sanitary compost latrine or household toilets, popularly known as Sulabh Shauchalaya. The first two categories are socially more accepted systems and all major cities and towns exceeding one lakh population have perspective plans already for full sewerage system including upgrading of septic tanks, notwithstanding excessive construction and maintenance cost. It has been acknowledged in various studies, corroborated by the observations in the present study, that untreated or partially treated sewerage and badly maintained systems could precipitate health hazards and septic tank are seldom free of mosquitoes and disposal of sludge is health hazardous as untreated sewage has to be handled.

Sustainability, replicability and affordability are the three important qualities which should be considered while choosing a technology. Sulabh Shauchalaya (twin pit pourflush toilet) developed by Sulabh International in 1970 fulfils these criteria fully. Although Sulabh Shauchalayas are being advocated, yet the dangers of water pollution from the leach pits are often being raised by several authorities desirous of adopting this system. However, it has been conclusively proved that with due precautions, Sulabh Shauchalaya system can be safely implemented in almost all the hydrogeological conditions.

It is against this background that the role of Sulabh and other

NGOs in terms of sustainability, affordability and replicability for environmental upgradation in urban areas needs to be assessed. In a way, the country document admits the inevitable acceptability of low-cost approach. Also, it unreservedly acknowledges the role played by NGOs such as Sulabh.

The contribution of Sulabh International and some localised NGOs in attaining satisfactory levels of urban environment has been confirmed by the study. In the task of capacity building to tackle problems of urban environment, a co-ordinated approach is needed. The avowed objective of the Government of India to eliminate scavenging by the end of the Eighth Plan (1992-97) itself is the most evident sign of the feasibility of conversion of dry latrines and the efficiency of low cost sanitation models which have already been implemented in India. The ambitious Eighth Plan national scheme of Rs. 464 crores for rehabilitation of scavengers again points out to the lead provided through the arduous task taken up by Sulabh International to train and rehabilitate scavengers and their dependents.

To sum up, the present study has established that :

- i) The Indian Experience of involving NGOs in LCS has yielded results;
- ii) Sulabh system and methodology qualifies on all counts as the 'best practice' in India to provide integrated low cost sanitation facilities thus contributing towards capacity building to tackle urban environmental problems;
- iii) urban slums need much more attention;
- iv) community toilet complexes, though acceptable to the people need extensive promotion for installation at strategic urban centres to control pollution and improve environment;
- v) gender specific facilities need to be augmented; and
- vi) bio-gas plants based on night soil are still to be promoted in a big way as a source of non-conventional energy resource and utilization of waste material in urban areas for environmental upgradation.

The low cost sanitation programmes being implemented by the local bodies and the NGOs/voluntary organisations confirm affordability, sustainability and replicability of the ongoing programmes, especially the one developed by Sulabh. It is also established that the Integrated Low Cost Sanitation cum Scavengers' Liberation Programmes have had the desired impact in changing the habit, attitude and behaviour of the people towards sanitation. It also firmly establishes the fact that to achieve sustainable development of communities, enterprises and citizens' participation in civic affairs, particularly sanitation and health services, the massive involvement of committed NGOs and voluntary organisations under the guidance of local

bodies administration is absolutely essential. It has been observed that low-cost sanitation programmes mainly benefit the weaker sections of our population and hence the commitment of government to sustain the programme is crucial for the success of the programme.

The study suggests certain approaches for formulation of a National Strategy to effectively enhance the Capacity Building for Urban Environment Management capabilities of institutions of self-government. This, inter alia, calls for a review of legislative measures and for amendments to the Seventy Fourth Constitution Amendment Act, 1992. Institutions of self-government need complete autonomy and improvement in consonance with the responsibilities of development to raise their financial

and human resources, which have not been adequately considered in the Act of 1992.

The study points out the special areas, such as gender issues and slum populations, requiring deliberate interventions. The heterogeneous nature of the urban settlements calls for meaningful local initiatives to address adequately the varying demands for the low cost sanitation package with low cost technology strategy and large scale involvement of NGOs, voluntary organisations and residents welfare associations. The one summary conclusion that the study enables us to draw is that the country is on the correct path, though obstacles would need to be constantly cleared, in our search for clean urban living.

TABLE - 4.1

SELECTION OF SAMPLE BENEFICIARIES OF HOUSEHOLD TOILETS AND COMMUNITY COMPLEXES
INSELECTED TEN TOWNS WHERE SULABH IMPLEMENTED THE SCHEME

State	Town/ City	Household Total	Toilets Sample size	Schedules adminis- tered	Community Total	Complexes Sample size	Schedules Admin- istered
SULABH							
Andhra Pradesh	Hyderabad	7402	111	125	26	1	34
Bihar	Patna	18235	274	272	39	2	46
Jammu & Kashmir	Jammu	9259	139	140	8	1	26
Karnataka	Bangalore	-	-	-	38	1	29
Madhya Pradesh	Bhopal	605	100	103	4	1	30
Maharashtra	Bombay	-	-	-	201	6	152
Orissa	Puri	2064	100	109	5	1	30
Rajasthan	Ajmer	23050	346	334	7	2	46
Tamil Nadu	Madras	26	26	25	61	2	50
Uttar Pradesh	Mirzapur	2878	100	100	19	1	25
OTHER NGOs*							
Tamil Nadu	Ambattur Kalai Selve Karunalaya	1450	100	100	28	1	29
Bihar	Gopalganj International Institute of Sulabh Systems	537	100	101	2	1	25
Madhya Pradesh	Barwani Akhil Bhartiya Rachnatmak Karya Sansthan	755	100	100	2	1	26
Uttar Pradesh	Gonda Manav Uthan Maha Samity	37	37	35	5	1	20
Andhra Pradesh	Hyderabad Lion Club, Urban Poor Society, Weaker Section Society, Urban Poor Syndicate	7300	109	105	1	1	25
	Grand Total	73598	1642	1649	446	23	593
	Sulabh Total	63519	1196	1208	408	18	468
	Other NGOs Total	10079	446	441	38	5	125

* Other NGOs Town/City, Name of the Organisation

TABLE 4.2
GEO-PHYSICAL RESOURCE BASE

State	Cities/ Towns	Area Sq.Km.	Elevation above mean sea level (Metres)	Soil (Series)	Hydrology			Water quality
					Average rainfall (past 10 years) mm	Ground Water level Summer (Metres)	Winter (Metres)	
Andhra Pradesh	Hyderabad	259	536	Sand	880	15/40	15	Sweet (Hard/ Brackish)
Bihar	Patna	09.22	53.0	Alluvial	1154	6/12	5/7	Good/sweet
Jammu & Kashmir	Jammu	400	450.0	Alluvial/ Boulder	1348	-	-	-
Madhya Pradesh	Bhopal	284.0	460	Red stone/ Morrum/ Lime Stone/ Black cotton	1260	7.97	3.30	Potable/ Soft
Karnataka	Bangalore	225	900	Black cot./ Rocky Gravel	741	7/8	5/6	Sweet/Hard
Maharashtra	Bombay	437.75	360/540	Black Cotton	1902	7.62	6.00	Sour/Pure
Orissa	Puri	16.84	12.19	Alluvial	-	6.1/12.2	3.1/7.6	Saline
Rajasthan	Ajmer	241.66	870	Sandy/ Rocky	494	90	60	-
Tamil Nadu	Madras	571.9	31.7	Alluvial/ Gravel/ Sandy	1286	5	1	Saline
Uttar Pradesh	Mirzapur	38.55	84.84	Alluvial/ Silt/sandy Loan/Kankar	1060	16.00	13.00	Potable
Bihar	Gopalganj	11.11	-	Clay	1292	7	4/5	good
Madhya Pradesh	Barwani	16.0	177.5	Black Cotton	507	20	18	Soft/potable
Tamil Nadu	Ambattur	40.3 clay	65/6	Clay/sandy	1200	5	2	Brackish
Uttar Pradesh	Gonda	12.6	795	Sandy/clay	1080	5.76	3.54	Potable

Source : District Census Hand Books and Municipal Offices

TABLE - 4.3
DEMOGRAPHIC CHARACTERISTICS

(in Lakh)

Town/City	Population (1991)					Population (1981)		
	Total	Male	Female	SC (%)	ST (%)	Total	Male	Female
Hyderabad	29.81	18.58	11.25	8.36	0.98	23.04	11.14	10.36
Patna	9.17	5.03	4.14	8.23	0.27	7.76	4.29	3.47
Jammu	N.A	N.A	N.A	N.A	N.A	2.06	1.09	0.97
Bhopal	10.63	5.61	5.02	11.82	2.77	6.7	3.59	3.12
Bangalore	26.61	3.91	2.71	2.02	0.79	24.76	13.05	11.71
Bombay	99.15	4.49	44.60	6.52	1.05	82.44	6.53	5.9
Puri	1.01	0.54	0.47	10.10	0.04	0.77	0.41	0.36
Ajmer	4.03	2.11	1.92	22.25	1.42	3.76	1.98	1.78
Madras	38.41	19.86	18.55	13.79	0.21	32.77	16.94	15.83
Mirzapur	1.69	0.97	0.73	12.31	—	1.28	0.69	0.59
Gopalganj	0.36	0.19	0.16	—	—	0.27	0.15	0.12
Barwani	0.34	0.18	0.16	—	0.2	80.1	50.13	—
Ambattur	2.15	1.12	1.03	—	1.16	0.61	0.35	—
Gonda	1.06	0.56	0.50	—	0.71	0.39	0.32	—

TABLE - 4.4
SLUM POPULATION AND AREA

Town/City	Slum population	Percentage of slum population	Slum area Sq.km.	Percentage of slum area
Hyderabad	341095	11.51	3.63	1.40
Patna	323230	35.21	8.80	8.00
Jammu	6000	2.90	1.50	3.75
Bhopal	244473	23.00	3.33	1.17
Bangalore	342189	12.86	10.15	6.71
Bombay	4459296	45.00	197.00	45.00
Puri	23017	30.97	0.75	4.45
Ajmer	6000	1.48	1.70	0.70
Madras	1605692	41.80	58.00	10.14
Mirzapur	69560	41.00	9.25	23.80
Gopalganj	6500	18.00	1.26	11.30
Barwani	8698	25.80	7.51	46.90
Ambattur	138992	64.52	34.00	84.24
Gonda	28540	26.92	4.56	35.52

TABLE - 4.5
HOUSEHOLDS WITHOUT TOILETS (1991)

Town/City	Total No. of Households	Households Without toilets (estimated No.)	Percent
Hyderabad	461070	49150	12.29
Patna	164490	37531	16.36
Jammu	N.A.	N.A.	
Bhopal	194755	558752	8.69
Bangalore	794065	125383	15.79
Bombay	2087785	455555	21.82
Puri	22765	7706	33.85
Ajmer	67455	14179	21.02
Madras	760600	134398	17.67
Mirzapur	24235	9578	39.52
Gopalganj	5714	3599	63.38
Barwani	4862	2109	43.38
Ambattur	48322	10616	21.97
Gonda	12223	3444	28.18

Source : Housing and Amenities, Occasional Paper, Census of India 1991.

TABLE - 4.6

HOUSEHOLDS TOILETS CONVERTED/CONSTRUCTED BY SULABH AND OTHER NGOS

Town/City	Sulabh		Other NGOs	
	Period	Number	Period	Number
Hyderabad	1986/90	7402	1992/95	7300
Patna	1974/88	18235	-	-
Jammu	1984/91	9258	-	-
Bhopal	1988/95	21558	-	-
Bangalore	—	-	-	-
Bombay	—	-	-	-
Puri	1987/95	2064	-	-
Ajmer	1989/95	23050	-	-
Madras	1990/28	-	-	-
Mirzapur	1988/94	2878	-	-
Gopalganj	1984/86	935	1994/95	537
Barwani	1991/92	654	1992/94	755
Ambattur	—	1991/94	1450	
Gonda*	1991/95	-	1991/95	N.A.

*Note : Household toilets converted/constructed in Gonda town is 2390, but the breakup of Sulabh and other NGOs not available

TABLE - 4.7

TOILETS FACILITIES IN URBAN HOUSEHOLDS IN INDIA - 1991*

	No. of urban households (Total)	Percent of households having toilet facilities	No. of Households without toilets (Estimated No.)	No. of Sulabh Shauchalayas (as on March 1995)**
India (Excluding Jammu & Kashmir)	39493450	63.85	14276882	730430
States				
Andhra Pradesh	3367905	54.6	1529029	14886
Arunachal Pradesh	25738	75.05	6422	-
Assam	471660	86.06	65749	920
Bihar	1857145	56.54	807115	203622
Goa	92781	55.82	40991	9218
Gujarat	2673960	65.71	916901	5
Haryana	729015	64.25	260623	132
Himachal Pradesh	109774	59.98	43932	-
Jammu & Kashmir	N.A.	N.A.	N.A.	25983
Karnataka	2488710	62.52	932769	1262
Kerala	1357365	72.66	371104	-
Madhya Pradesh	2726030	53	1281234	211468
Maharashtra	5907495	64.45	2100114	8794
Manipur	83018	70.16	24773	3403
Meghalaya	62825	85.69	8990	-
Mizoram	56388	84.44	8774	-
Nagaland	48714	75.1	12130	-
Orissa	814980	49.27	413439	30755
Punjab	1023470	73.23	273983	3656
Rajasthan	1712450	62.27	646107	112866
Sikkim	7813	77.69	1743	-

	No. of urban households (Total)	Percent of households having toilet facilities	No. of Households without toilets (Estimated No.)	No. of Sulabh Shauchalayas (as on March 1995)**
Tamil Nadu	3915695	57.47	1665345	12136
Tripura	85054	96.32	3130	5515
Uttar Pradesh	4316660	66.54	1444354	72061
West Bengal	3609230	78.75	366961	10220
Union Territory				
Andaman & Nicobar	15291	65.72	5242	-
Chandigarh	128555	79.77	26007	-
Dadra & Nagar Haveli	2292	65.14	799	-
Daman & Diu	9048	45.75	4909	-
Delhi	1696828	66.64	566062	3475
Lakshadweep	4510	64.65	15694	-
Pondicherry	93051	50.02	46507	33

Source : *Census of India, 1991 Housing and Amenities, Occasional Paper, New Delhi.
N.A. : Jammu and Kashmir Census, 1991 was not conducted

**Sulabh International Social Service Organisation, New Delhi.

TABLE - 4.8

DISTRIBUTION OF SAMPLE HOUSEHOLDS ACCORDING TO MONTHLY INCOME

Town/city	upto Rs. 1250	Rs. 1251 to Rs. 2500	Rs. 2501 to Rs. 4000	Above Rs. 4000	Total
SULABH					
Ajmer	85 (25.5)	200 (59.9)	33 (9.9)	16 (4.8)	334 (100.0)
Bhopal	25 (24.3)	77 (74.8)	1 (1.0)	-	103 (100.0)
Madras	13 (52.0)	11 (44.0)	1 (4.0)	-	25 (100.0)
Patna	52 (19.1)	178 (65.4)	28 (10.3)	14 (5.1)	272 (100.0)
Puri	1 (0.9)	79 (72.5)	22 (20.2)	7 (6.4)	109 (9.0)
Jammu	43 (30.7)	90 (64.3)	5 (3.6)	2 (1.4)	140 (100.0)
Mirzapur	10 (10.0)	62 (62.0)	19 (19.0)	9 (9.0)	100 (100.0)
Hyderabad	15 (12.0)	96 (76.8)	14 (11.2)	-	125 (100.0)
OTHER NGOS					
Ambathur	4 (4.0)	50 (50.0)	46 (46.0)	-	100 (100.0)
Gopalganj	26 (25.7)	49 (48.5)	22 (21.8)	4 (4.0)	101 (100.0)
Barwani	31 (30.4)	35 (34.3)	20 (19.6)	16 (15.7)	102 (100.0)
Gonda	12 (34.3)	20 (57.1)	3 (8.6)	-	35 (100.0)
Hyderabad	17 (16.5)	53 (51.5)	20 (19.4)	13 (12.6)	103 (100.0)
Grand Total	334 (20.3)	1000 (60.6)	234 (14.2)	81 (4.9)	1649 (100.0)
Sulabh Total	244 (20.2)	793 (65.6)	123 (10.2)	48 (4.0)	1208 (100.0)
Other NGOs Total	90 (20.4)	207 (46.9)	111 (25.2)	33 (7.5)	441 (100.0)

TABLE - 4.9

WOMEN AND CHILDREN BELONGING TO SAMPLE HOUSEHOLDS USING/NOT USING PF LATRINES

Town/city	Household using the latrines	Household not using the latrines	Total
SULABH			
Ajmer	194 (58.1)	140 (41.9)	334 (100.0)
Bhopal	82 (19.6)	21 (20.4)	103 (100.0)
Madras	24 (96.0)	1 (4.0)	25 (100.0)
Patna	262 (96.3)	10 (3.7)	272 (100.0)
Puri	89 (81.6)	20 (18.4)	109 (100.0)
Jammu	135 (96.4)	5 (3.6)	140 (100.0)
Mirzapur	78 (78.0)	22 (22.0)	100 (100.0)
Hyderabad	103 (82.4)	22 (17.6)	125 (100.0)
OTHER NGOs			
Ambattur	60 (60.0)	40 (40.0)	100 (100.0)
Gopalganj	67 (66.3)	34 (33.7)	101 (100.0)
Barwani	72 (70.6)	30 (29.4)	102 (100.0)
Gonda	33 (94.3)	2 (5.7)	35 (100.0)
Hyderabad	101 (98.1)	2 (1.9)	103 (100.0)
Grand Total	1300 (78.8)	349 (21.2)	1649 (100.0)
Sulabh Total	967 (80.0)	241 (20.0)	1208 (100.0)
Other NGOs Total	333 (75.5)	108 (24.5)	441 (100.0)

TABLE - 4.10

NUMBER OF HOUSEHOLDS STATING THE PLACE OF DEFECACTION BY WOMEN AND CHILDREN

Town/City	Open field	On the road side	Open drain	Any other	Total
SULABH					
Ajmer	107 (76.4)	21 (15.0)	4 (2.9)	8 (5.7)	140 (100.0)
Bhopal	5 (23.8)	-	16 (76.2)	-	21 (100.0)
Madras	1 (100.0)	-	-	-	1 (100.0)
Patna	9 (90.0)	1 (10.0)	-	-	10 (100.0)
Puri	11 (55.0)	1 (5.0)	8 (40.0)	-	20 (100.0)
Jammu	5 (100.0)	-	-	-	5 (100.0)
Mirzapur	13 (59.1)	6 (27.3)	1 (4.5)	2 (9.0)	22 (100.0)
Hyderabad	10 (45.5)	3 (13.6)	7 (31.8)	2 (9.0)	22 (100.0)
OTHER NGOS					
Ambathur	22 (55.0)	6 (15.0)	-	12 (30.0)	40 (100.0)
Gopalganj	31 (91.2)	2 (5.9)	-	1 (2.9)	-
Barwani	20 (66.1)	6 (20.0)	2 (6.7)	2 (6.7)	30 (100.0)
Gonda	-	2 (100.0)	-	-	2 (100.0)
Hyderabad	-	2 (100.0)	-	-	2 (100.0)
Grand Total	234 (67.0)	50 (14.3)	38 (10.9)	27 (7.7)	349 (100.0)
Sulabh Total	161 (66.8)	32 (13.3)	36 (14.9)	12 (5.0)	241 (100.0)
Other NGOs Total	73 (67.6)	18 (16.7)	2 (1.8)	15 (13.9)	108 (100.0)

TABLE - 4.11

THE BENEFICIARIES CONSULTED IN THE PLANNING AND IMPLEMENTATION OF PF LATRINES

Town/city	Consulted	Not consulted	Total
Ambattur	25 (25.0)	75 (75.0)	100 (100.0)
Gopalganj	99 (98.0)	2 (2.0)	101 (100.0)
Barwani	63 (61.8)	39 (38.2)	102 (100.0)
Gonda	14 (40.0)	21 (60.0)	35 (100.0)
Hyderabad	3 (2.9)	100 (97.1)	103 (100.0)
Total	204 (46.3)	237 (53.7)	441 (100.0)

TABLE 4.12

REASONS FOR CONVERSION OF BUCKET LATRINES OR CONSTRUCTION OF PF LATRINES

Town/City	Dissatisfied with scave- nger service	Scavenger service too expensive	Convenience reasons	Health/ Hygiene	Lack of privacy for women	Any other	Total
Ambattur	1 (1.0)	-	46 (46.0)	5 (7.9)	15 (15.0)	33 (33.0)	100 (100.0)
Gopalganj	1 (1.0)	-	86 (85.1)	8 (7.9)	-	6 (5.9)	101 (100.0)
Barwani	35 (34.3)	2 (2.0)	20 (19.6)	40 (39.2)	1 (1.0)	4 (3.9)	102 (100.0)
Gonda	16 (45.7)	15 (42.9)	-	3 (8.6)	-	1 (2.9)	35 (100.0)
Hyderabad	8 (7.8)	-	59 (57.3)	36 (35.0)	-	-	103 (100.0)
Total	61 (13.8)	17 (3.9)	211 (47.8)	92 (20.8)	16 (3.8)	44 (10.0)	441 (100.0)

TABLE - 4.13
CATEGORIES OF SAMPLE BENEFICIARIES

Town/city	Local	Commuters	Total
SULABH			
Ajmer	34 (73.9)	12 (26.1)	46 (100.0)
Bombay	89 (58.5)	63 (41.5)	152 (100.0)
Bhopal	30 (100.0)	-	30 (100.0)
Madras	14 (28.0)	36 (72.0)	50 (100.0)
Patna	36 (78.3)	10 (21.7)	46 (100.0)
Puri	21 (70.0)	9 (30.0)	30 (100.0)
Jammu	20 (76.9)	9 (23.1)	26 (100.0)
Mirzapur	21 (84.0)	4 (16.0)	25 (100.0)
Bangalore	23 (79.3)	6 (20.7)	29 (100.0)
Hyderabad	28 (82.4)	6 (17.6)	34 (100.0)
OTHER NGOs			
Ambattur	28 (96.6)	1 (3.4)	29 (100.0)
Gopalganj	15 (60.0)	10 (40.0)	25 (100.0)
Barwani	16 (61.5)	10 (38.5)	26 (100.0)
Gonda	12 (60.0)	8 (40.0)	20 (100.0)
Hyderabad	2 (8.0)	23 (92.0)	25 (100.0)
Grand Total	389 (65.6)	240 (34.4)	593 (100.0)
Sulabh Total	316 (67.5)	152 (32.5)	468 (100.0)
Other NGOs Total	73 (58.4)	52 (41.6)	125 (100.0)

TABLE - 4.14

NUMBER OF SAMPLE BENEFICIARIES HAVING/NOT HAVING LATRINES OF THEIR OWN

Town/city	Having latrines	Having no latrines	Total
SULABH			
Ajmer	20 (58.8)	14 (41.2)	34 (100.0)
Bombay	32 (36.0)	57 (64.0)	89 (100.0)
Bhopal	1 (3.3)	29 (96.7)	30 (100.0)
Madras	12 (85.7)	2 (14.3)	14 (100.0)
Patna	16 (44.4)	20 (55.6)	36 (100.0)
Puri	10 (47.6)	11 (52.4)	21 (100.0)
Jammu	8 (40.0)	12 (60.0)	20 (100.0)
Mirzapur	13 (61.9)	8 (38.1)	21 (100.0)
Bangalore	22 (95.7)	1 (4.3)	23 (100.0)
Hyderabad	16 (57.1)	12 (42.9)	28 (100.0)
OTHER NOGs			
Ambattur	2 (7.1)	26 (92.9)	28 (100.0)
Gopalganj	5 (33.3)	10 (66.7)	15 (100.0)
Barwani	1 (6.3)	15 (93.7)	16 (100.0)
Gonda	3 (25.0)	9 (75.0)	12 (100.0)
Hyderabad	2 (100.0)		2 (100.0)

Town/city	Having latrines	Having no latrines	Total
Grand Total	163 (41.9)	226 (59.1)	389 (100.0)
Sulabh Total	150 (47.5)	166 (52.5)	316 (100.0)
Other NGOs Total	13 (17.8)	60 (82.2)	73 (100.0)

TABLE - 4.15

NUMBER OF SAMPLE BENEFICIARIES STATING WHETHER WOMEN ARE USING/NOT USING

Town/city	Using community complex	Not using community complex	Total
SULABH			
Ajmer	3 (8.8)	31 (91.2)	34 (100.0)
Bombay	48 (53.9)	41 (46.1)	89 (100.0)
Bhopal	26 (86.7)	4 (13.3)	30 (100.0)
Madras	5 (35.7)	9 (64.3)	14 (100.0)
Patna	7 (19.4)	29 (80.6)	36 (100.0)
Puri	10 (47.6)	11 (52.4)	21 (100.0)
Jammu	2 (10.0)	18 (90.0)	20 (100.0)
Mirzapur	3 (14.3)	18 (85.7)	21 (100.0)
Bangalore	3 (13.0)	20 (87.0)	23 (100.0)
Hyderabad	12 (42.8)	16 (57.2)	28 (100.0)
OTHER NGOs			
Ambattur	9 (32.1)	19 (67.9)	28 (100.0)
Gopalganj	-	15 (100.0)	15 (100.0)
Barwani	4 (25.0)	12 (75.0)	16 (100.0)
Gonda	7 (58.3)	5 (41.7)	12 (100.0)
Hyderabad	-	2 (100.0)	2 (100.0)

Town/city	Using community complex	Not using community complex	Total
Grand Total	139 (35.7)	250 (64.3)	389 (100.0)
Sulabh Total	119 (37.7)	197 (62.3)	316 (100.0)
Other NGOs Total	20 (27.4)	53 (72.6)	73 (100.0)

TABLE - 4.16

DISTRIBUTION OF SAMPLE HOUSEHOLDS ACCORDING TO TYPES OF FACILITIES

Town/City	Toilet	Bathing	Urinal	Toilet and bathing	Urinal and toilet	Urinal toilet and bathing	Total
SULABH							
Ajmer	16 (47.1)	1 (2.9)	1 (2.9)	7 (20.6)	1 (2.9)	8 (23.5)	34 (100.0)
Bombay	38 (37.1)	-	1 (1.1)	3 (3.4)	42 (47.2)	10 (11.2)	89 (100.0)
Bhopal	7 (23.3)	-	-	12 (40.0)	-	11 (36.7)	30 (100.0)
Madras	9 (64.3)	-	3 (21.4)	1 (7.1)	-	1 (7.1)	14 (100.0)
Patna	2 (5.5)	-	-	2 (5.5)	5 (13.9)	27 (75.0)	36 (100.0)
Puri	15 (71.4)	-	-	6 (28.6)	-	-	21 (100.0)
Jammu	4 (20.0)	-	-	1 (5.0)	4 (20.0)	11 (55.0)	20 (100.0)
Mirzapur	12 (57.1)	1 (4.8)	-	2 (9.5)	2 (9.5)	4 (19.1)	21 (100.0)
Bangalore	3 (13.0)	-	4 (17.4)	1 (4.3)	14 (60.9)	1 (100.0)	23 (100.0)
Hyderabad	14 (50.0)	-	-	6 (21.4)	8 (28.6)	-	28 (100.0)
OTHER NGOs							
Ambattur	28 (100.0)	-	-	-	-	-	28 (100.0)
Gopalganj	1 (6.7)	1 (6.7)	-	-	12 (80.0)	1 (6.7)	15 (100.0)
Barwani	10 (62.5)	-	-	-	6 (37.5)	-	16 (100.0)
Gonda	4 (33.30)	-	-	8 (66.7)	-	-	12 (100.0)

Town/City	Toilet	Bathing	Urinal	Toilet and bathing	Urinal and toilet	Urinal toilet and bathing	Total
Hyderabad	1 (50.0)	-	-	-	-	1 (50.0)	2 (100.0)
Grand Total	159 (40.9)	3 (0.8)	9 (2.3)	49 (12.6)	95 (24.4)	74 (19.0)	389 (100.0)
Sulabh Total	115 (36.4)	2 (0.6)	9 (2.8)	41 (13.0)	76 (24.1)	73 (23.1)	316 (100.0)
Other NGOs							
Total	44 (60.3)	1 (1.4)	-	8 (10.9)	19 (26.0)	1 (1.4)	73 (100.0)

TABLE - 4.17

NO. OF SAMPLE BENEFICIARIES WHO ENCOUNTERED DIFFICULTIES IN USE OF COMMUNITY COMPLEXES

Town/City	Encountered difficulty	Encountered no difficulties	Total
SULABH			
Ajmer	9 (26.5)	25 (73.5)	34 (100.0)
Bombay	9 (10.1)	80 (89.9)	89 (100.0)
Bhopal	2 (6.7)	28 (93.3)	30 (100.0)
Madras	1 (7.4)	13 (92.9)	14 (100.0)
Patna	-	36 (100.0)	36 (100.0)
Puri	2 (9.5)	19 (90.5)	21 (100.0)
Jammu	13 (65.0)	7 (35.0)	20 (100.0)
Mirzapur	2 (9.5)	19 (90.0)	21 (100.0)
Bangalore	-	23 (100.0)	23 (100.0)
Hyderabad	-	28 (100.0)	28 (100.0)
OTHER NGOs			
Ambattur	27 (94.5)	1 (3.6)	28 (100.0)
Gopalganj	-	15 (100.0)	15 (100.0)
Barwani	9 (56.3)	7 (43.8)	16 (100.0)
Gonda	8 (66.7)	4 (33.3)	12 (100.0)
Hyderabad	-	2 (100.0)	2 (100.0)

Town/City	Encountered difficulty	Encountered no difficulties	Total
Grand Total	82 (21.0)	307 (78.9)	389 (100.0)
Sulabh Total	38 (9.8)	278 (90.2)	316 (100.0)
Other NGOs Total	44 (60.3)	29 (39.7)	73 (100.0)

BIBLIOGRAPHY

1. Ahmad, Z., Evaluation of Low-Cost Water-Seal Latrines in Bihar (Mimeograph), Patna : Department of Sociology Patna University, 1980.
2. Ambedkar, B.R., Mr. Gandhi and the Emancipation of the untouchables. Bombay : Thacker, 1943.
3. Ambedkar, B.R., The Untouchables, Balrampur (U.P.) Bhartiya Buddha Sikhsha Parishad, 1969.
4. Barve, B.N., The Scavengers Living Conditions Enquiry Committee, Government of Maharashtra, Bombay, 1958.
5. Chaudhary, Pratima, Problems of Female Scavengers of Patna, in S.N. Choudhary, ed./Changing Status of Depressed Castes in Contemporary India, Delhi, 1988.
6. Dass J.R.J., Bhangi Kasht Mukti and Bhangi Mukti, Delhi : Harijan Sewak Sangh, Delhi, 1968.
7. Gandhi, M.K., The Removal of Untouchability compiled by B. Kumarappa, Najjiram Publishing House, Ahmedabad, 1954.
8. Government of India, Planning Commision, Eighth Five Year Plan, 1992-97.
9. Government of Haryana, Commission to Enquire into Living Conditions of Safai Mazdoors Employed by Local Bodies and Private Scavengers Working in Haryana State, 1961.
10. Government of India, UNICEF, National Seminar on Low-Cost Techniques for Disposal of Human Wastes in Urban Communities, Patna, 1978.
11. Government of India, UNDP, International Seminar on Low-Cost Techniques for Disposal of Human Wastes in Urban Communities, Calcutta, 1980.
12. Government of India, UNDP, Regional Conference on Low-Cost Pour-Flush Latrines, Udaipur, 1982.
13. Government of India, UNDP, Regional Seminar on Low-Cost Sanitation, Ministry of Works and Housing, 1982.
14. Government of India, UNDP, Social Mobility Among the Sweepers of India : Census of India, New Delhi Office of the Registrar, Ministry of Home Affairs, 1961.
15. Government of India, UNDP, Report of Customers' Rights and Living and Working Conditions of Scavengers in Two Towns, Census of India Monograph Series Vol.I, Part XI-D, Ministry of Home Affairs, 1961.
16. India Today, Can we clean up the mess? October 31, 1994.
17. Issacs, Harold R., India's Untouchables, Asia Publishing House, Bombay, 1965.
18. Kalbermatten, J.M., Sanitation-Convenience for a Few or Health for Many; the Report on the International Seminar on Low-Cost Techniques for Disposal of Human Wastes in urban Communities, Annexure II, Calcutta, 1980.
19. Mahant, N.M., Mehtar Mimansa, Harijan Sewak Sangh, Bikaner, 1949.
20. Mahar, Michael J., Untouchables in Contemporary India, Tuscon: The University of Arizona Press, Tuscon, 1973.
21. Malkani, M.R., The Report of Committee on the Customary Rights to Scavenging, Ministry of Home Affairs, Govt. of India, New Delhi, 1966.
22. Milkani, M.R., Report of Scavenging Conditions Enquiry Committee, Central Advisory Board for Harijan Welfare, Ministry of Home Affairs, Government of India, 1961.
23. Mulkraj Anand, Untouchables, Jaico Publishing House, Bombay, 1956.
24. Pathak, Bindeshwar, Sulabh Shauchalaya : A Simple Idea That Worked Amola Prakshan, Patna, 1981.
25. Pathak, Bindeshwar, Sulabh Shauchalaya : A Study of Directed Change, Amola Press and Publications, Patna, 1982.
26. Pathak, Bindeshwar, Road to Freedom - A Sociological Study on the Abolition of Scavenging in India, Motilal Banarsi Dass Publishers, Delhi, 1991.
27. Pathak, Bindeshwar, Action Sociology and Development, Concept Publishers, New Delhi, 1992.

28. Ribeiro, Edgar F., Improved Sanitation and Environmental Health Conditions - An Evaluation of Sulabh International's Low-Cost Sanitation Project in Bihar, Ministry of Urban Development, Govt. of India, 1985.
29. Roy, A.K. et.al, Manual on the Design, Construction and Maintenance of Low-Cost Pour-Flush Water- Seal Latrines in India. TAG Technical Note No. 10, UNDP, International Project, The World Bank, Washington, 1984.
30. Roy, Prodipto et.al, ``Measuring Bustee Environment in Calcutta'' Social Change, Vol. 22, No. 1, March 1992.
31. Sabirali, Slums Within Slums, Har Anand Publications, New Delhi, 1990.
32. Sabirali, Pay and Use toilets and Low-cost Alternatives for Solid Waste management, Har Anand Publication, New Delhi, 1991.
33. Salappa, I.P.D., Committee on Improvement of Living and Working Conditions of Sweepers and Scavengers. Government of Karnataka, 1976.
34. Sinha, Bakshi D. and Arun K. Ghosh, Evaluation of Low-Cost Sanitation: Liberation, Training and Rehabilitation of Scavengers, Arnold Publishers, New Delhi, 1990.
35. Sinha, Bakshi D. and Arun K. Ghosh, Sanitation and Environment Evaluation of Low-Cost Sanitation in Gujarat, Arnold Publishers, New Delhi, 1991.
36. Sinha, Bakshi D., P.S.K. Menon and Arun K. Ghosh, Restoration of Human Dignity : Impact of Development Programme on Scavengers, Arnold Publishers, New Delhi, 1994.
37. Srivastava, B.N., State Action for the Liberation of Scavengers, in Report of the National Seminar on Action Sociology and Liberation of Scavengers, New Delhi, Feb. 8-10, 1992.
38. Wagner, E.G. and J.N. Lanoix, Excreta Disposal for Rural Areas Small Communities, World Health Organization, Geneva, 1958.
39. Zajac, V. et. al, Appropriate technology for water supply and sanitation : Urban sanitation planning manual based on the Jakarta case study. (World Bank technical paper number 18). World Bank, Washington, 1984.

I-21012/8/94-H.II(Vol. III)
Government of India
M/o Urban Affairs & Employment
D/o Urban Employment & P.A.

Nirman Bhawan, New Delhi.
Dated the July 17, 1996

To,

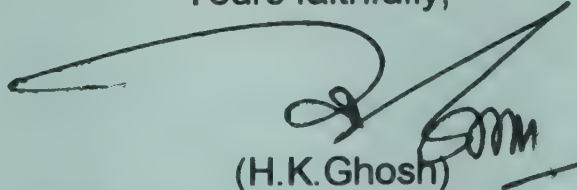
Shri Bindeshwar Pathak,
Founder,
Sulabh Internatioanl Social Service Organisation,
Sulabh Bhawan,
Mahavir Enclave, Palam Dabri Road,
New Delhi
110 045

Subject: **Habitat -II -Best Practices submitted by India.**

Sir,

This Ministry has received a Press Release from the
"Together Foundation", New York, on the Best Practice cases
submitted by India. A copy of the Foundation letter dated June 27,
1996 alongwith the Press Release pertaining to your project, is sent
herewith. You may like to utilise this for publicity.

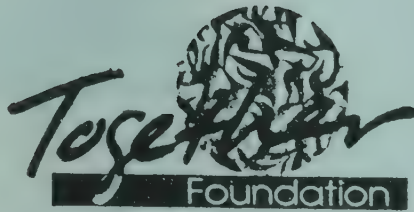
Yours faithfully,


(H.K. Ghosh)
Under Secretary(Housing)
Tel. No. 301 9331

Chairman
Receipt No. 188
Date. 29.7.96

DEV-120
08509

38(R)



June 27, 1996

55 East 75th Street
New York, New York
10021 USA

Tel • 212.628.1939
Fax • 212.628.4265

Best Practice Project Directors
100 Best Practices
Best Practices Database

Dear Colleagues:

First let me say congratulations to all of you who have worked so hard to make your projects as successful as they have been. It confirms my belief that the unsung heroes of our world are working in the trenches, making a tangible difference in people's lives.

I'm enclosing a press release that we at the Together Foundation and our partners in the database, the United Nations Centre for Human Settlements, believe might be of some help to you in terms of public relations. We suggest that you couple the release with some brief (one-page) information about your project that includes specific contact information so that the media can follow up.

Please send or fax to us any articles that may come as a result of this effort. Our presumption here is that you are much better equipped to decide the best place to send these press releases than we are sitting here in New York.

May the wind always be beneath your wings.

Sincerely,

A handwritten signature in dark ink, appearing to read "W. J. Sims", is written over the word "Sincerely,".

1265-H-11
12/7/96 William J. Sims
Executive Director

1121-D-2(n)
11-7-96

We may send the
copy of the release
to you - concerned
org.

11/7
HJH

1395
10/7/96

26
10/7

2/11/97
R 9/6/97
1/2/1/11/97



PRESS RELEASE

FOR IMMEDIATE RELEASE

India's "Cost Effective & Appropriate Sanitation Systems - Sulabh
International Project"

Recognized As a Global Urban Best Practice

HABITAT II Conference - Istanbul, Turkey

DATE: June 24, 1996

CONTACT: William J. Sims, Executive Director, Together Foundation
55 East 75th Street, NY, NY 10021

PHONE: 212-628-1939 USA

The United Nations emphasized "two unique features of Habitat II - 'The City Summit,' (that) are likely to lead to concrete results:" First, a strong emphasis on "the need for new partnerships to tackle the problems of cities," and second, showcasing "some 600 examples of best practices for improving the living environment."

The Cost Effective & Appropriate Sanitation Systems - Sulabh International Project was ranked in the top 100 of the Best Practices Database for Human Settlements by the United Nations Centre for Human Settlements for the Habitat II City Summit in Istanbul.

The Best Practices Database for Human Settlements is a computer database of proven solutions to urban problems that exist in the world today. The database is packed with real case studies of projects that are effectively dealing with urban problems, ranging from clean water to sanitation, housing, crime, recreation, and mass transit, among others.

The inventory of these case studies was collected by the United Nations Centre For Human Settlements in Nairobi, Kenya and then catalogued in a unique, standardized, multimedia database by the Together Foundation in New York City.

The database can be accessed via CD-ROM, Windows® or DOS® diskettes or on the World-Wide Web. More information about the database is available at (212) 628-1939.

"The Best Practices initiative has been perhaps the conference's most useful element, providing delegates and non-governmental organizations an opportunity to see the results of programs that have worked elsewhere . . . this aspect of the conference may turn out to provide the greatest value to human settlements." -- Daniel Shepard, *Earth Times*

"This database is an unprecedented collection of practical and proven solutions to urban problems. It's a tool that allows governments, urban planners, and community-based leaders to get information about effective practices that match particular problems in their own cities, towns, and hamlets." -- Bill Sims, *Together Foundation*

